School Shop

vol. XVII no. 4

DECEMBER 1957

Coordinating a Safety Program
by William Micheels

Do-It-Yourself Vacuum Cleaner
by Arvin H. Maggard

Color Anodizing Aluminum
by C. B. Porter and R. N. Evans

Cover story: A shop instructor showing a student the safe way to use a circular saw. Notice that the student is wearing safety goggles, a short-sleeved shirt, has no tie.

THE MAGAZINE FOR TEACHERS OF INDUSTRIAL EDUCATION

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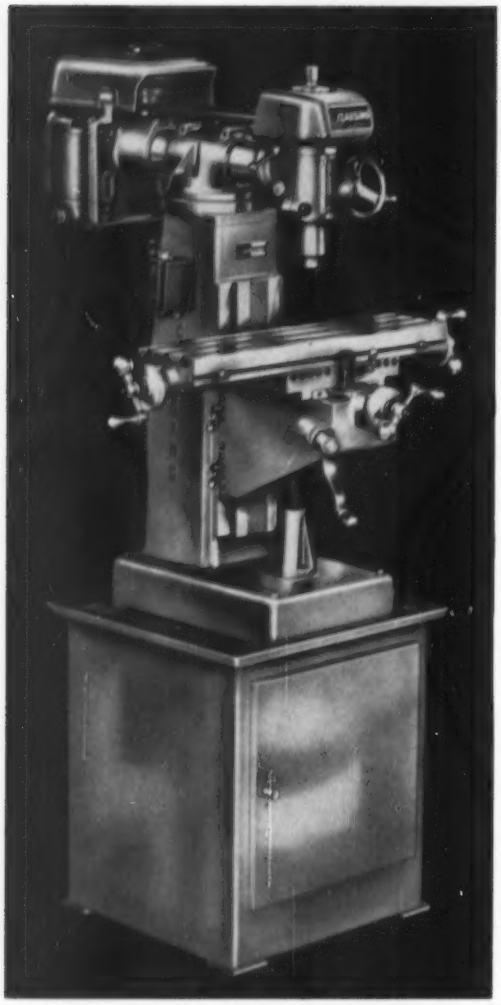

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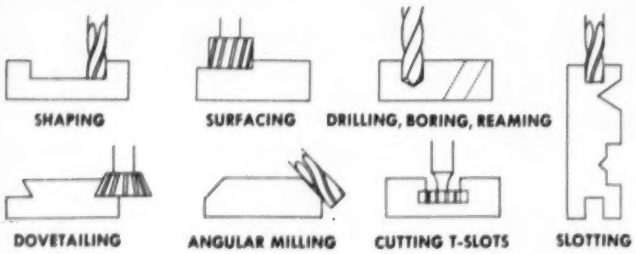

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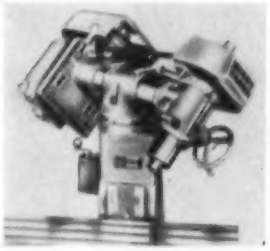

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School Shop

THE MAGAZINE FOR TEACHERS OF INDUSTRIAL EDUCATION

Vol. XVII, No. 4 December 1957

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School Shop TALK

COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

No Touchdown Here!

Cast in the role of guinea pig for the new Joint Federal-State Action Committee, vocational-education grants from the federal government will apparently get quite a going over by the Committee and, possibly, by Congress when it reconvenes next month.

As our Washington correspondent has pointed up in the columns of SCHOOL SHOP earlier this fall, the Committee is charged by President Eisenhower, who appointed it, with the task of recommending areas of federal activity in both grant provisions and taxation where the federal government could move out and the state and local governments could move in.

Vocational education is a "beauty" in the words of John Stambaugh, the executive secretary of the Committee, for the kind of lateral pass play the Committee has in mind. It is a "beauty," says Stambaugh, because the amount of the federal support is small in comparison with other federal expenditures and the machinery for administering the funds is predominantly in state hands.

The pass play would work something like this. The federal government would relinquish to the states some of the wartime nuisance taxes that were imposed, with the supposition that the states would take them over and use them for vocational education, as well as for other activities now federally supported such as the school-lunch program. The federal levy on local telephone calls is the kind of tax the Committee has in mind.

To our way of thinking, there are lots of fumble dangers in this kind of pitch-out for vocational education.

For instance, do you think that each of the state legislatures will take over the federal nuisance taxes or substitute some other tax to provide the funds to keep vocational-education programs going? The states have been complaining that the federal government has usurped the major sources of tax revenue but most state legislatures are very loathe to add new taxes. In many of the states, vocational education might very well be left with a serious reduction in support.

The ten state governors on the Joint Federal-State Action Committee might very well subscribe to this plan as might other governors who are not on the Committee. But—and it's no little "but"—will the state legislatures go along on the idea? Our guess is that many will not. It's naive to think that all states will automatically take over a tax formerly levied by the federal government just because the federal government has stepped out of the play.

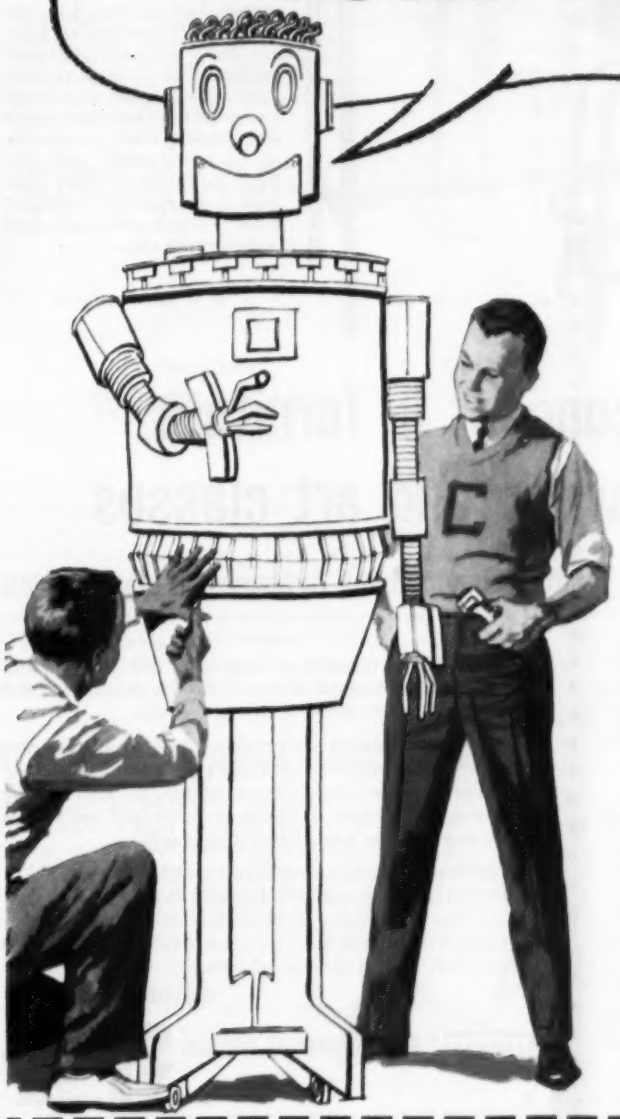
In the last decade, the percentage of funds for vocational education from the federal government has dropped from 28 percent to 19 percent. During this same period, the total expenditures for vocational education have increased nearly two and a half times. Obviously state and local governments have been supporting this phase of education more generously as the programs have proved their worth.

From the foregoing it might be concluded that the federal government could step out of the picture and little or no harm would accrue to the education of boys and girls in these United States. Certainly vocational education would not roll over and play dead! There is too much evidence that the youth of the nation needs an opportunity to secure the kind of training that vocational education provides.

The danger lies in the fact that inequalities exist between the states in the ability to support vocational education and the federal grants serve in some measure to overcome these inequalities or, at least, they provide a minimum program which might not otherwise be available. Moreover, the federal vocational-education service has provided and, no doubt will continue to provide a type of national leadership that is most helpful. While some school districts have smarted under federal regulations imposed on recipients of federal vocational grants, others have been stimulated by these same regulations to provide a better program than might otherwise have been the case.

No one can tell what the new Congress will do, but we earnestly hope that the Joint Federal-State Action Committee's announced plans for vocational education get tabled.—*L. W. P.*

How about your students . . . are they preparing for the big FORD IAA program?



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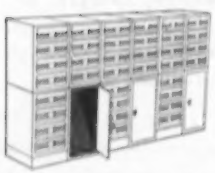
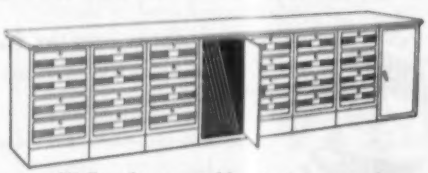
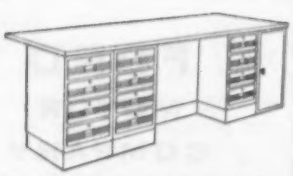


2-high section of service units. Has 36 drawers, holds 36 boards.



Wall reference table—6 drawer units, 2 drawing board units hold 24 boards.



Planning table—3 drawer units, 1 drawing board unit for 12 boards.

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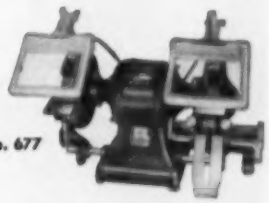

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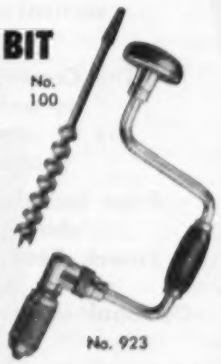

No. 100

No. 923

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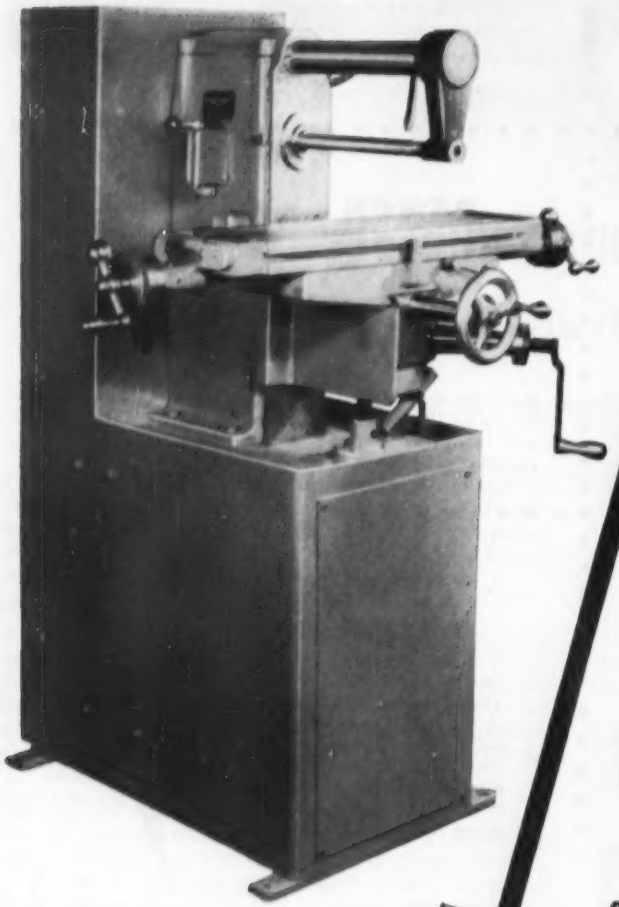

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"Administrators should assign someone the job of finding out what must be done with respect to safety and education and then he must be given responsibility for seeing that this is done. The individual must be delegated proper authority and resources to achieve the desired goals."

Coordinating a Safety Program

By William J. Micheels

Professor and Chairman of Industrial Education, University of Minnesota, Minneapolis

SAFETY efforts can succeed only if those with final authority really wish to reduce accidents. This is as true for an educational program as it is for an industrial establishment. A positive and planned program of safety education is a necessity in every modern educational institution.

"Many instructors emphasize the points of safety necessary to operate power equipment but neglect hand-tool safety as being 'unimportant'."

In 1955, 93,000 deaths occurred in this country as a result of accidents. During that same period there were more than nine million injuries as a result of accidents. Of these accidents, 1,914,200 happened at work.

The cost of these accidents amounted to more than ten billion dollars!

Accidental deaths among children five to fourteen years old totalled 6,150 in this same year.

While no comprehensive national figures are available concerning the nature and incidence of accidents in industrial-education shops, numerous studies have been carried out on a local and regional basis. The following generalizations, adapted from those studies, will be of interest to school administrators and safety coordinators.

Shop instructors receive a varied amount of training in safety and accident prevention; in some cases they are not trained at all. Several of the studies indicated that many instructors depend on trial and error for their safety knowledge.

Most accidents happen between the hours of 10-11 A.M. and 2-3 P.M. It is assumed that fatigue and exposure are the most operative factors. There are conflicting opinions regarding the importance of fatigue as a cause.

More accidents happen on Wednesday than on any other day of the week. Exposure is given as the explanation of this fact. Students probably reach the peak of productivity by mid-week and then taper off as the work progresses.

The months of May, April, March, October, and January have the highest frequency of shop accidents. The months are given in descending order. February is the starting point for a continuous increase in the number of shop accidents until it reaches its peak in May.

Shop students between 15 and 16 years old tend to have the highest accident rates. There is no satisfactory explanation of this fact. A possible reason is that this is the time that a student goes through a rapid physical growth and tends to be clumsy and selfconscious.

Woodworking and metals areas seem to be the most hazardous areas.

Frequency of accidents in the use of hand tools is higher than the frequency in the use of machine tools. An exposure-and-rate study should prove very helpful in explaining this. Many instructors emphasize the points of safety necessary

"Dull tools can't be handled with proper control."

to operate power equipment but neglect hand-tool safety as being "unimportant."

There are more minor shop accidents than major accidents by a ratio of about seven to one. Therefore, it seems reasonable to assume that more emphasis should be placed on the study of minor accidents. Most studies agree that every minor accident was potentially a major accident.

The chisel, saw, and knife account for the largest number of hand-tool accidents. The frequency of chisel accidents is almost as high as that of accidents happening on all other tools combined. The use of dull chisels may be a cause. Dull tools cannot be handled with proper control; hence, their use often leads to accidents.

The amount of shop experience a student has is reflected in a corresponding decrease in accident rate. This would tend to substantiate the desirability of safety training.

There is a definite relationship between level of intelligence and accident proneness. A higher mental-ability group seems to have fewer accidents.

There is a definite relationship between level of intelligence and accident repeaters. Those in the lower intelligence level repeat accidents more often.

Unsafe acts or practices are given most often as the cause of accidents. This area, as well as several others, needs much more study.

Students give "failure to understand safe practices" as the most common cause of accidents. This indicates the need for safety instruction, which brings an "awareness" of accident potentials, may prevent a student from "forgetting all" and taking hazardous short cuts in order to rush a project through to completion.

The need for further study on accident causes is indicated by the disagreement between students' and teachers' opinions of accident causes. Teachers give "carelessness on the part of the student" as the most common cause of accidents.

The studies indicate that teachers need more information on accident analysis. Accident analysis should serve as an instructive instrument as well as a means of gaining statistical data.

Any good accident reporting system includes a report of the causal and contributory factors involved. There seems to be quite common agreement on this point in the studies reviewed.

Severe injuries are reported as more likely to occur in the automotive, metals, and woodworking areas than in other shops.

Injuries sustained on the senior-high school level seem to be more severe in nature than those on the junior-high level. This may be because more machines are used on the senior-high level, and junior-high students are more timid around unfamiliar tools and equipment.

The parts of the body that are most often injured are fingers and thumbs.

Several of the studies show that industrial-education teachers do administer first aid to shop students. There is no indication as to their qualification for administering first-aid treatment. There seems to be justification for a shop teacher being trained in basic first-aid practices. In some school systems, this is a requirement.

Proper attitudes toward safety and safety education must be reflected from the administration through the supervisory personnel to the instructional staff the custodial staff, and all persons having a responsibility in the training program that is carried on. These attitudes must be inculcated in the student. It should be made clear to him that industry demands safe as well as efficient workers.

A modern program of safety education proceeds on the theory that all accidents are preventable, and that both administration and teachers should assume the responsibility for making both the working environment and students as safe as is humanly possible.

The first implication of this theory is that serious hazards, wherever they may be, must be discovered and immediate steps taken to reduce the hazards. Unsafe work procedures must also be detected and changed.

Administrators should assign someone the job of finding out what must be done with respect to safety and safety education and then he must be given responsibility for seeing that this is done. The individual must be delegated proper authority and the necessary resources to achieve the desired goals. Unless this happens, any safety program is apt to be sterile.

In delegating authority, the administrator should emphasize three basic needs that must be met: (1) the need for regular and carefully planned inspections of shop facilities with respect to safe practices; (2) the need for a carefully planned program of safety instruction on the part of each instructor; and (3) the need for prompt and proper accident reporting and analysis on the part of each staff member.

Before proper control measures can be organized, the extent and nature

(*Continued on page* 40)

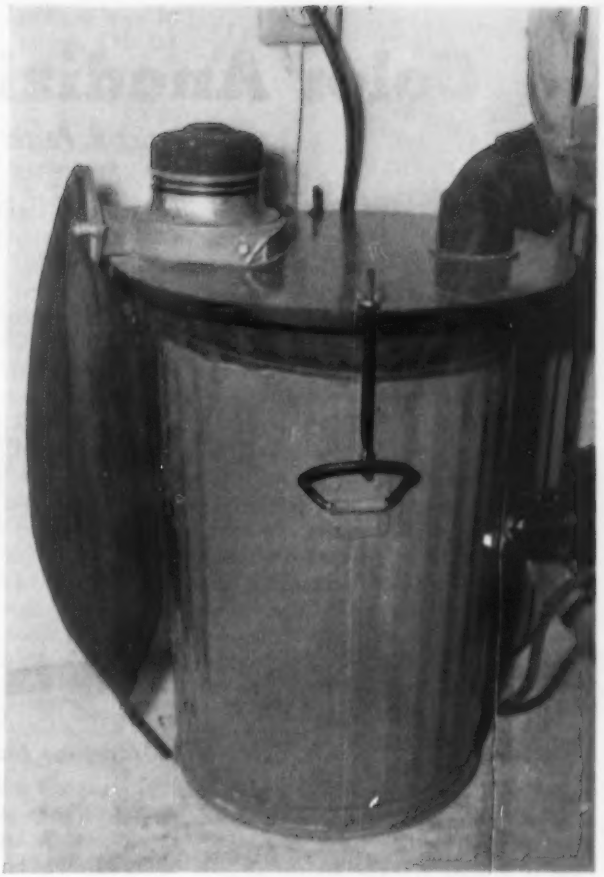
"The will to work safely develops from an understanding of what accidents are; how costly they can be to an individual, his family, and his industry; and how they can be prevented . . . such an understanding and attitude can be developed . . . will be of as much value as vocational skills learned."

Clear the air in your shop with this

Do-It-Yourself Vacuum Cleaner

By Arvin H. Maggard

Ponce de Leon Junior-High School, Coral Gables, Florida



A do-it-yourself vacuum cleaner (right) made from a stripped down, upright vacuum cleaner and a standard-sized garbage can. Note the lid overlapping can.

A DO-IT-YOURSELF vacuum cleaner is a neat way to clear the air of the dust problem in your shop, especially if you use a floor-model sander.

The cleaner shown here is made from parts of an old upright cleaner and the accompanying drawing shows how to make it.

The vacuum cleaner should be stripped down, leaving the exhaust and the housing for mounting on a piece of circular-cut ¾" plywood. The diameter of the plywood should be 2" greater than that of a standard garbage can that it will set on.

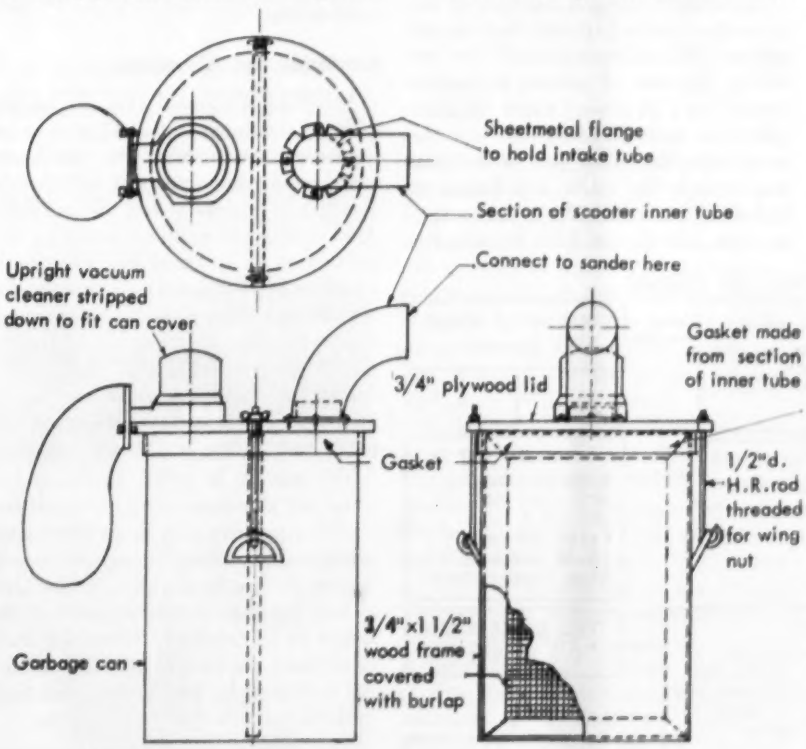
The two clamps for the lid can be made of ⅜" rod, curved at one end to hook under the garbage can's handles, and threaded at the other to receive a wing nut. To insure a good fit between the plywood top and the garbage can's rim, make a gasket out of an old inner tube.

The stripped-down vacuum cleaner should be mounted on one side of the lid and an intake-hose bracket—made from sheetmetal—can then be mounted on the opposite side with screws.

The burlap-screen divider inside of the can is very important because it catches the dust and keeps it in the can. Some dust is bound to pass through the screen and will be caught in the exhaust bag. The bag will also keep the flow of air that passes through the cleaner from passing around the room and kicking up dust.

This is an inexpensive item to make because old vacuum cleaners are available, generally, from dealers at low cost. Its value to you in keeping your shop clean and a proper environment for students to learn in will exceed any monetary outlay the school might have to make.

Besides being a valuable addition to your shop equipment, it will also provide a good project for some of your more advanced students. ★


Sheetmetal flange to hold intake tube
Section of scooter inner tube
Connect to sander here
Upright vacuum cleaner stripped down to fit can cover
Gasket made from section of inner tube
3/4" plywood lid
Gasket
1/2"d. H.R. rod threaded for wing nut
3/4"x1 1/2" wood frame covered with burlap
Garbage can

DUST COLLECTOR

Color Anodizing Aluminum

By Charles B. Porter and Rupert N. Evans
University of Illinois, Urbana

ELECTRO-CHEMICAL finishing of metal products is an important area of industry that is poorly represented in industrial-education classes. Color anodizing of aluminum is an electro-chemical process which can be done inexpensively and safely in the school shop, and produces results that are very attractive.

The first wide use of color anodizing was in the finishing of inexpensive costume jewelry and household items such as drinking glasses in a variety of colors, including blue, green, violet, yellow, red, copper, and gold. More recently it has been applied to automotive trim, business machines, camera parts, interior hardware, and trim for household appliances. The process yields a product which is not only attractive but is also more resistant to abrasion and corrosion than plain aluminum.

The color anodizing process is simple and with ordinary care will yield satisfying results. The aluminum to be colored is formed into the desired shape, cleaned, anodized, dyed, and sealed. The equipment required consists of a variable dc power source such as a battery charger and an assortment of glass, plastic, or ceramic jars.

Forming the Aluminum

The first consideration is the choice of an alloy of aluminum. Generally speaking, all of the pure aluminum and aluminum alloys used in school shops are suitable. The purer the aluminum, the brighter the color, but the only aluminum alloy which causes trouble has more than 5 percent silicon. This alloy is used principally in die casting, and will seldom come into the school shop. If you want matched colors, however, be sure that all of the matching pieces are of the same alloy.

Form the aluminum in any way you desire, and finish it in any conventional way. Sandblasted, etched, buffed, hammered, and wire-brushed finishes take color anodizing very well. You may want to put a design on the product, using one of the above processes. This, too, is satisfactory. Patterned aluminum works as well as plain aluminum.

A limited amount of forming can be done after color anodizing, but results are generally much better if the forming is done first.

Cleaning the Aluminum

This process will not work on a dirty surface. If any grease is present, this should first be removed by degreasing or by washing in hot water containing a detergent. Wash it just as if it were a greasy pan, being sure to rinse it well after washing.

Following cleaning, the surface of the aluminum is etched slightly in a caustic solution. This solution is made by dissolving 2½ oz. of sodium hydroxide (NaOH) in 1 qt. of cool water. (Sodium hydroxide may be obtained from the school chemistry laboratory or the local drug store.) The solution is heated to its boiling point in a Pyrex jar or baking dish, and the article to be etched is immersed in it for 15 seconds to one minute. Care must be observed to prevent the solution from coming into contact with the skin or clothing. The aluminum article should be handled only with wooden tongs while in the solution. Following etching, the article should be rinsed one minute under flowing water.

If the article is left in the caustic etch solution too long, a black copper smut will be formed on the surface of the aluminum. This smut may be removed by immersing the article for a few seconds in a bright dip solution operated at room temperature. The bright dip may be made by mixing 300 cc of sulfuric acid (H_2SO_4), 150 cc of nitric acid (HNO_3), 0.5 cc of hydrochloric acid (HCl) in 38 cc of water. *Caution:* When making up this solution be sure to use a stoneware jar and always add the acid to the water. Add the acid very slowly and stir with a wooden stick. Considerable heat of reaction is generated when making up this solution which will cause ordinary glassware to break. If any of the solution should come in contact with the skin or eyes, flood the affected part with running water and call a physician.

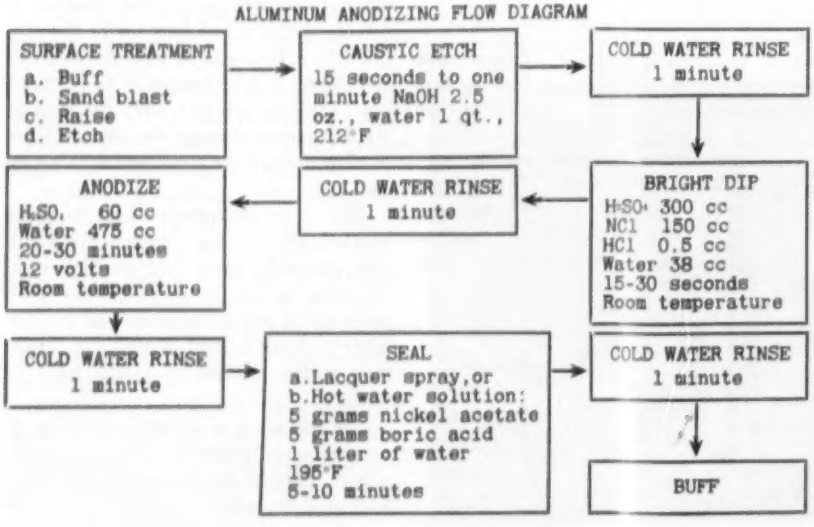
Anodizing the Aluminum

Anodizing aluminum (Fig. 1) causes a film of aluminum oxide (Al_2O_3) to be formed on the surface. The aluminum oxide coating is porous and will absorb dyes made especially for the purpose. After dyeing, the article is sealed by immersing it in a special hot water bath which causes the aluminum oxide molecule to take on one molecule of water thus converting it to the monohydrate, aluminum oxide ($Al_2O_3 \cdot H_2O$). This causes the aluminum oxide coating to increase in volume, thus closing off the pores and sealing in the dye material.

The process is called anodizing because the aluminum article is made the anode or positive pole in an electrolytic solution. The cathode or negative pole is a piece of sheet lead with a surface area at least equal to the surface area of the article to be anodized. Sometimes lead-lined tanks are used to hold the anodizing solution, in which case, the tank itself is used as the negative pole.

The solution used for color anodizing consists of a 20 percent solution, by

ALUMINUM ANODIZING FLOW DIAGRAM



weight, of sulfuric acid. The solution is operated at room temperature and consists of 475 cc of water (preferably distilled) and 60 cc of concentrated sulfuric acid (H_2SO_4). Again observe the precaution of adding the acid to the water in a stoneware or Pyrex jar. Do not allow the solution to come into contact with skin or clothing.

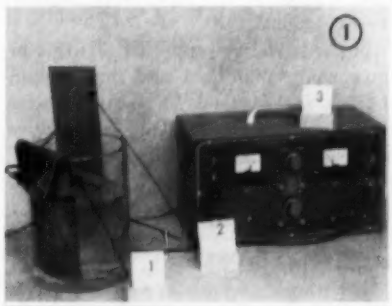
Battery electrolyte, which is available from most garages and service stations, will also work satisfactorily as the anodizing solution. It is somewhat more concentrated but the results are, for all practical purposes, identical.

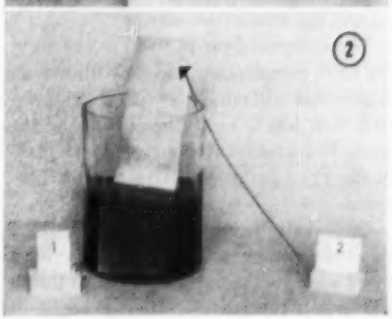
A source of direct current is required for the process. The voltage should be variable and metered. A kit-made battery eliminator is used here because it is relatively inexpensive, the output is adjustable, and both output voltage and current can be read from meters contained in the unit.

The article to be anodized is immersed in the sulfuric-acid solution which is contained in a glass, plastic, or stoneware jar and connected to the positive terminal of the power source. The connection to the article must be made with an aluminum clip or wire. Copper or steel clips immersed in the solution will contaminate it. Care must be exercised to insure that a good electrical connection is made with the article.

Sometimes the article can be fabricated so as to leave a small tab on the edge which may project out of the solution and to which connection may be made with the power source. This tab may be clipped off later. Sheets of aluminum may be anodized half at a time and the electrical connection is made by clipping the positive terminal to the portion of the sheet extending out of the solution. In the event that aluminum clips or wire are to be used again, care must be taken to file off the previously anodized surface of the clip or wire where contact is to be made with the article being anodized because aluminum oxide is a poor conductor of electricity.

Fig. 1: (1) lead sheet (negative terminal); (2) article being anodized (positive terminal); (3) direct-current power source to two terminals.
Fig. 2: (1) dye solution contained in nonmetallic jar; (2) piece of aluminum that is being dyed.





The negative terminal of the power supply is connected to a sheet of lead which has an immersed area at least equal to the surface area of the article to be anodized. The connection from the power source must be made to part of the lead sheet which projects out of the solution.

After all connections are made, the power source is turned on and adjusted to an output voltage of approximately 12 v. The article is allowed to anodize for 20 to 30 minutes. Lower voltage may be used but the anodizing time will have to be increased.

When the article has been anodized, turn off the power source and rinse the article for one minute under running water.

Dyeing the Aluminum

The anodized article is immersed in the dye solution (Fig. 2) for 5 to 15 minutes. The length of time in the dye solution determines the intensity of the color. A short time will yield pastel shades while a longer time will yield dark shades. Timing is fairly critical for matching colors. The dyes are obtained in powder form and are mixed in the approximate proportion of 2 grams of dye per liter of water. Very satisfactory concentrations of dye solution may be obtained by mixing the powder in the proportion of one teaspoon of dye per pint of water. The dye solution is operated at room temperature.

Commercial dyes are available in small quantities. We got ours from the District Sales Office of Sandoz Chemical Works, Inc., 3712 Beechmont Avenue, Cincinnati 26, Ohio. The smallest quantity available is one pound. This amount of dye will be sufficient to last several lifetimes so it is suggested that several shop teachers may want to go together in the purchase of dyestuffs. The price of dyes ranges from about $3.00 per pound to about $7.00 per pound depending on the color. Of the hundred or so colors available from Sandoz we recommend the Blue A, Green AX, Yellow D, Bordeaux 2R (red), Violet 3D, and Copper ND p.a.f. One pound each of the above mentioned dyes will cost approximately $28.00

Fig. 3: piece of aluminum undergoing sealing.

Experiments with other dyeing materials have yielded considerably less satisfactory results. Rit, a commercial preparation for dyeing cloth, has been tried. Rit Gold 23 mixed in the proportion of one package of dye to ¼ pint of water and operated at 180° yields a rather pleasing gold tone. Rit Fuschia 12 mixed in the same proportions gives a pale pink. Several other colors were tried but with unsatisfactory results.

After the article is dyed, it should be rinsed for one minute under running water.

Sealing the Aluminum

The article may be sealed in two ways. It may be given a spray coat of lacquer which tends to seal in the dye or it may be sealed in a hot water solution. The latter method (Fig. 3) provides a surface which is considerably more durable but has less lustre than the lacquer seal.

The hot-water sealing solution is made up of 5 grams of nickel acetate and 5 grams of boric acid per liter of water. The solution is operated just under the boiling point. The article to be sealed is immersed in the hot solution, which is contained in a Pyrex jar or baking dish, for 5 to 10 minutes. The purpose of the nickel acetate and boric acid in the solution is to tend to minimize leaching out of the dye from the anodized article. After sealing, the article should be rinsed, dried, and buffed to a satisfactory lustre, using a clean muslin wheel. ★

With winter here

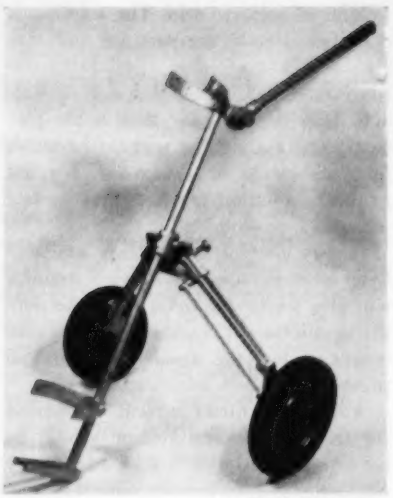
It's Time to Work on a Golfing Cart

By Fay Daley and William Mieszczak

Drafting and Machine Shop Instructors, respectively, Erie Technical High School, Pa.

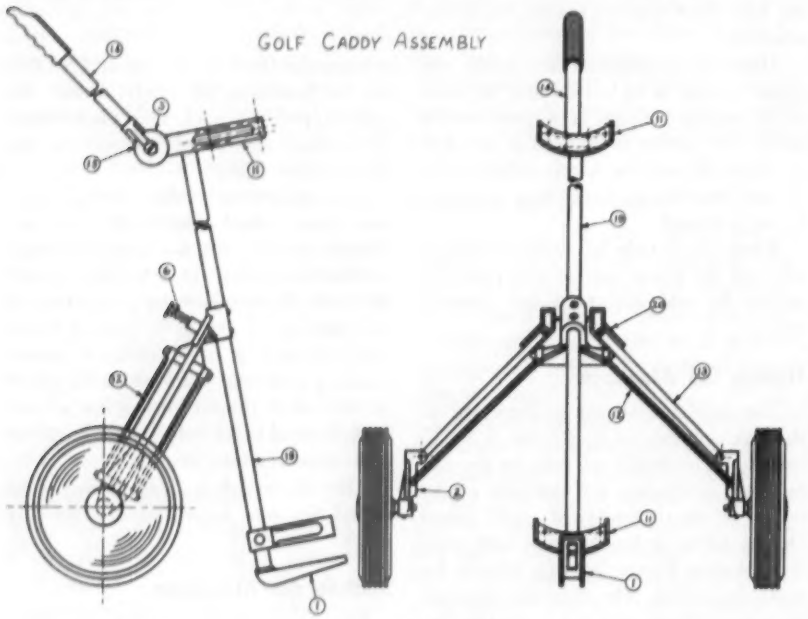
DON'T let the snow and cold weather dismay you. Spring, summer, and the golfing season are as sure to return as the swallows.

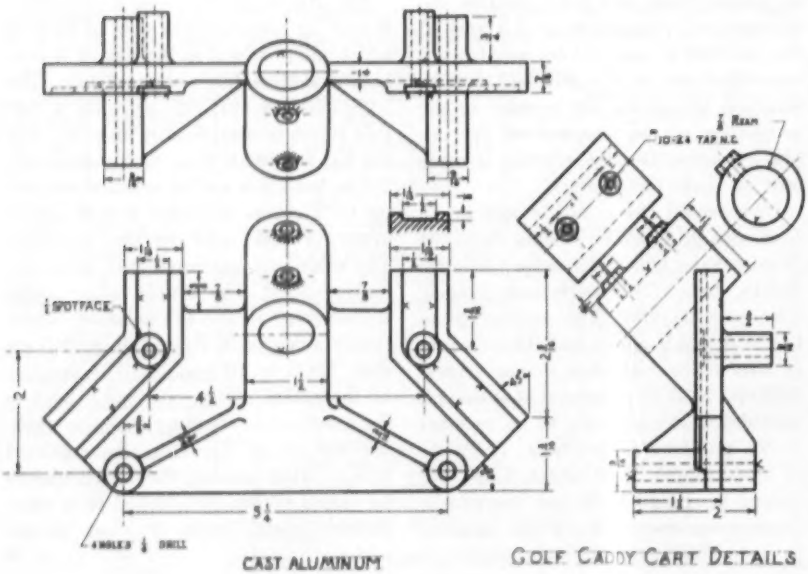
This golf cart has many features in its favor as a project, incorporating drafting, patternmaking, molding, and machining. Excellent opportunity is afforded in blueprint reading, lathe work, milling-machine work, drilling, tapping, and bench work. A fine lesson can be taught in working with aluminum, and the transference of "classroom math" to the shop. Moreover, the necessity for accuracy is of no mean significance either and students can see that what they are doing has real application.



Ford Motor Co. Photo

A completed golfing cart made out of aluminum.





We drew this project in the drafting room for its value as an ideal problem for correlation of dimension and its visualization in proper views and as a unit. The final tracings were working drawings for the various shops that would be involved.

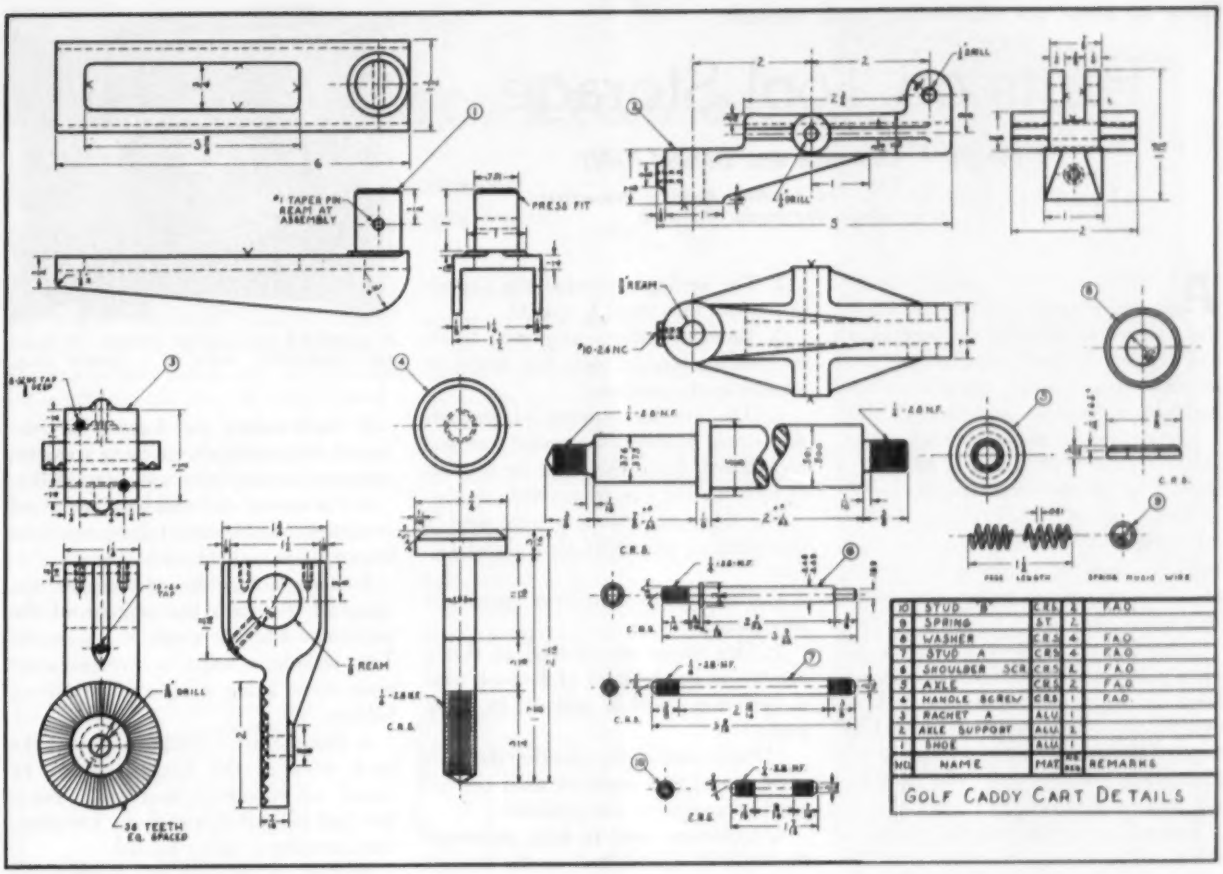
The pattern shop made the patterns. This necessitated some aluminum theory lessons. The proper draughts had to be illustrated; preparing the sand and ramming up of the mold were part of the experience.

For material we appealed to firms in town using aluminum and then melted it down. If the school has no other means to melt the metal, the ladle with scrap aluminum can be heated in the well of the heat-treating furnace. This is an excellent opportunity for some safety lessons. *Asbestos leggings, gloves, and goggles are a MUST.*

The wheels and tubing can be bought. So can the smaller set screws.

The completed project will have taught the boys cooperation and they'll have an article that will compare with its counterpart that has a pretty healthy price tag on it. This project won an ingenuity prize in the Ford Industrial Arts Awards program.

Oh, yes! It's Capistrano where the swallows return to and they'll be back there soon so it's high time to start thinking of golf again. ★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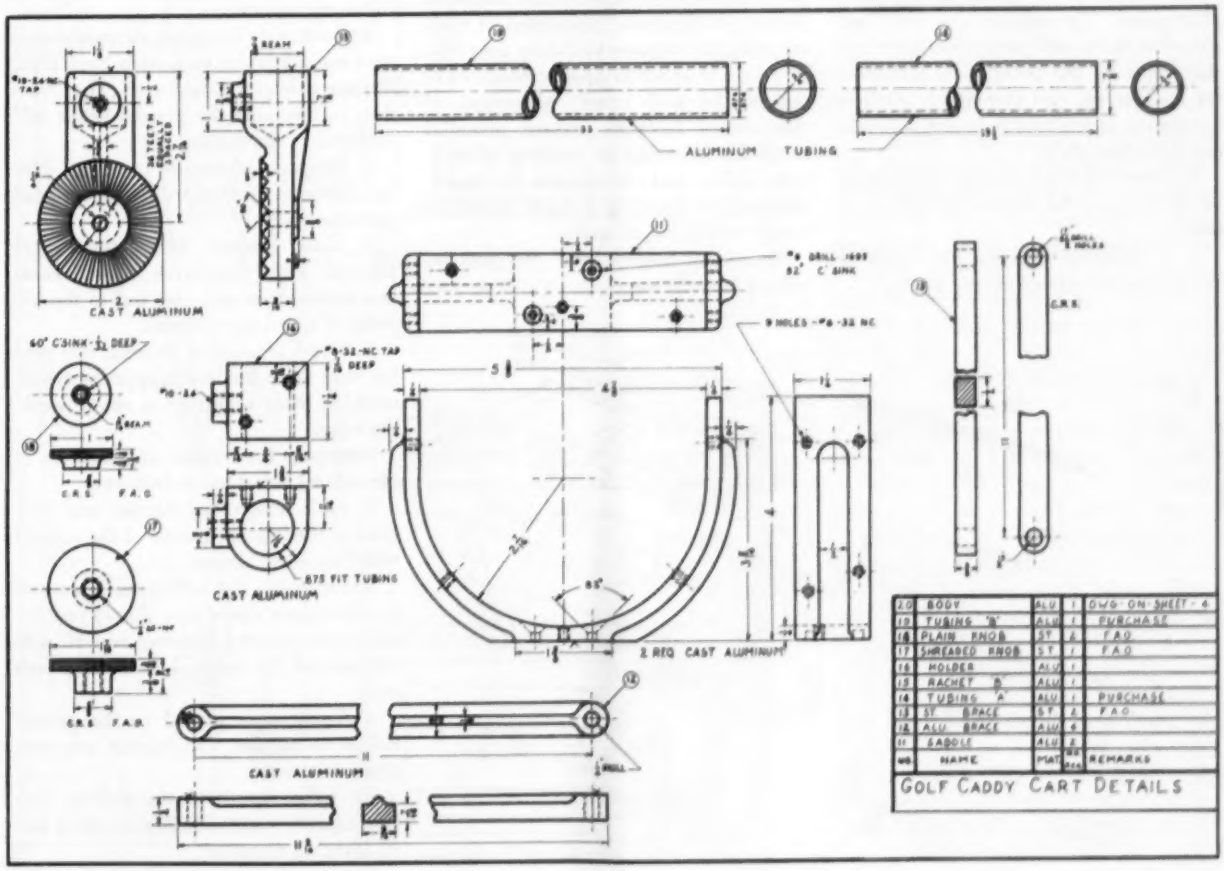
NO. NAME MAT REMARKS
GOLF CADDY CART DETAILS

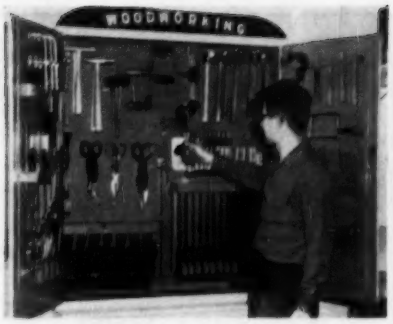

ALUMINUM TUBING
CAST ALUMINUM
60° C'SINK
REAM
10-24 NC TAP
.875 FIT TUBING
CAST ALUMINUM
9 HOLES -#6-32 NC
2 REQ CAST ALUMINUM
BODY
TUBING B
PLAIN KNOB
SHREADED KNOB
HOLDER
RACHET B
TUBING A
ST BRACE
ALU BRACE
SADDLE
NO. NAME MAT REMARKS
GOLF CADDY CART DETAILS

How to step up efficiency and morale

Hints on Tool Storage

By Dwight D. Chinnock and Donald Hiller

Supervisor of Cadet Teaching and Teaching Assistant, respectively, Stout State College, Menomonie, Wisconsin



A completed tool cabinet suitable for metal and woodworking areas of a general shop.

ALTHOUGH efficient shop management depends to a large extent on the availability of tools to students, all too frequently insufficient attention is given to stool storage, types of holders and hangers, and the placement of tools.

Yet any tool cabinet which is incorrectly designed, or which is in need of repair, produces such needless shop problems as delay in checking out and returning tools, tool breakage or "borrowing," loss of student and teacher shop-time, deterioration of class morale, and safety hazards.

Experience has shown that an efficiently arranged tool cabinet which is kept in good repair immediately increases the efficiency of all shop functions. The tool cabinet described in this article was planned, built, and placed in use in a general shop.

Following are the specific phases of the planning and construction of the tool cabinet shown in the accompanying photograph. The cabinet was built and placed in the most central location of the shop, making the tools more accessible for student use and preventing needless congestion in the tool area and throughout the entire shop.

To select the kind of tools to be placed in the cabinet, the following steps were taken:

1. A complete analysis was made of the metals and woodworking areas.

2. The analysis revealed the various operations that could be taught.

3. These operations were used to determine the type of tools that would be needed by the students.

4. The average number of students who would be taking the course was next ascertained. From this data the number of tools needed was determined.

The following criterions were used in the planning phases of the cabinet layout:

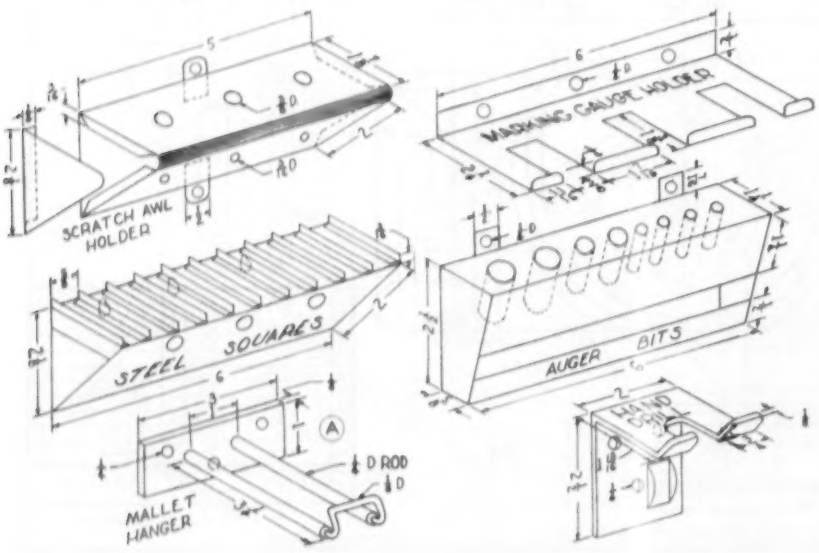
1. The amount of cabinet space was determined.

2. This space was divided so that a systematic arrangement of the tools used in each area could be laid out on detail paper.

3. Paper cutouts representing the tools were placed and replaced until the desired arrangement was obtained.

4. Criterions used to help determine the location of each tool on the interior panels of the cabinet were: the height of students using tools; placement of tools according to frequency of shop use; conservation of space to prevent overcrowding of the tool panel; placement of sharp-edged tools to prevent potential accidents occurring on removal of adjacent tools; and attachment of small, light-weight tools to cabinet doors to assure utilization of space.

Designing holders and hangers involved the following:



1. Each holder and hanger was designed with emphasis given to strength, appearance, simplicity, and adaptability.

2. The size of each tool was considered so that each holder and hanger would be large enough to hold the tool easily.

3. Each tool holder and hanger was designed to match the contour of the particular tool for which it was made. This technique helps to prevent some tools from being misplaced in wrong holders.

4. Hangers were designed so that the open ends of the hangers would be closed to prevent a tool from being knocked off and dropping on a student, thus creating a safety hazard.

Holders and hangers were made in the following manner:

1. Holders, to be strong enough to support any particular tool, were made from 24 gage galvanized sheet steel. They were then formed into the desired shape and soldered at the seams.

2. Hangers were made from ¼" drill rod fastened to strap iron with flat-head machine screws.

3. Each holder and hanger was painted. Paint improves attractiveness and appearance and also makes the absence of a tool conspicuous.

4. Wood, because of its bulk, was used for only those holders supporting woodworking tools requiring a sharp working edge.

Fastening the holders and hangers to the cabinet was done as follows:

1. Each holder and hanger was fastened to the interior panels of the cabinet with oval-head screws.

2. Fastening the holders and hangers to the cabinet was a very simple task because the planned drawing had already determined the exact placement of each tool.

3. Tools were placed in the proper holder or hanger. The cabinet was now ready for use.

By following these suggestions, you can improve your shop organization and its learning situation. ★

The idea came from the mountains

My Guns Were Framed!

By Stan Schirmacher
Papago School, Phoenix, Arizona

SOMEWHERE in Arizona's "Superstition Mountain" area, a region noted for the "Lost Dutchman's Mine," dwells a cabinet-maker who had an idea for a gun-display case. His idea slowly wended its way to my shop where it has proven a good woodworking project.

This gun cabinet, aside from its teaching usefulness, not only frames its owner's guns, but encases them for protection and displays them at a 30° angle.

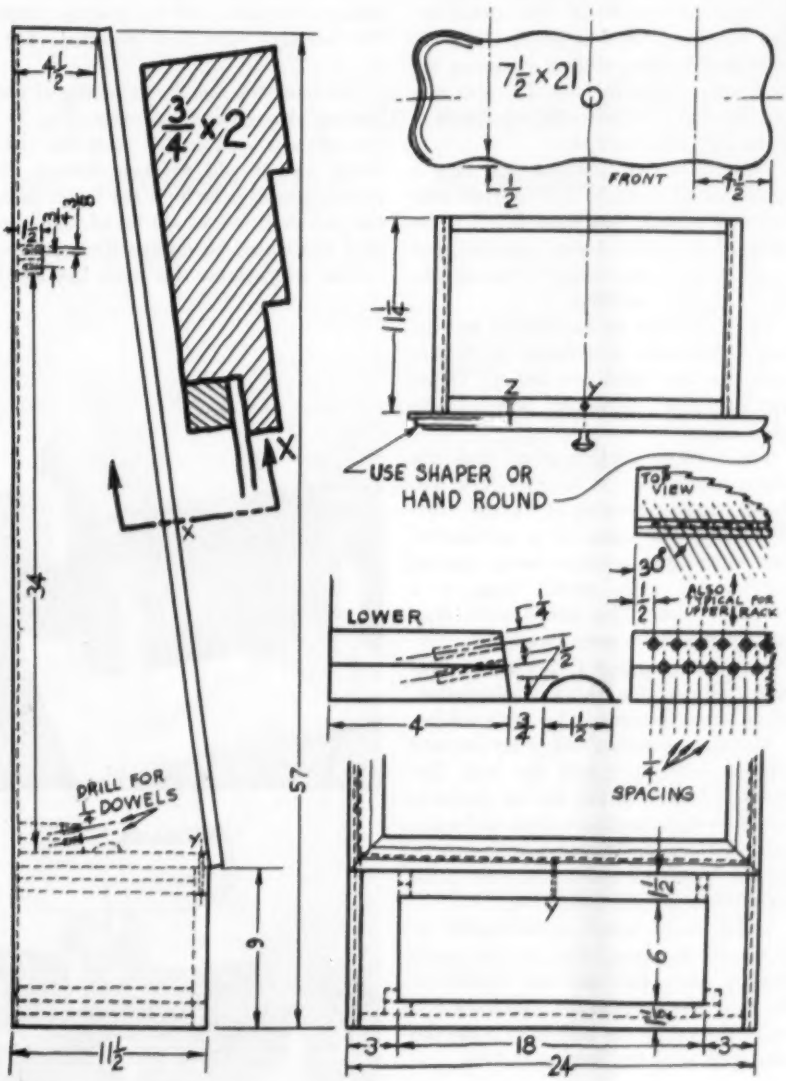
The woodworking operations necessary are apparent from the drawing. The stock can be varied to suit individual tastes. In this case, redwood and mahogany were used.

The sides are made of 1 x 12 stock, rabbeted along with the top, to the back which can be of ¼" plywood.

One of the features of this cabinet is the *double* set of holes for the dowels (to position the guns) which allow for smaller (¼") adjustments. These racks can be made up of three instead of two boards glued together, thus allowing for three sets of holes.

By using ⅛" spacing, a closer fit for each gun on display is possible.

A completed gun case, based on an idea that originated in Arizona's "Superstition Mountain."



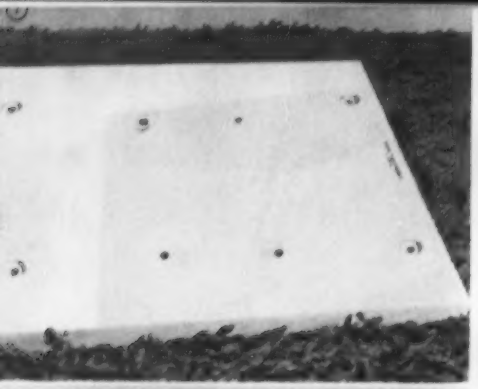
As shown in the drawing, the holes in both bottom and top racks are drilled at 30° angles. This determines the positioning of the guns relative to the perpendicular. For a balanced appearance, the holes continue to ½" past the right end. However, the last few end holes cannot be used because of the dowel angle.

Another feature is the metal nameplate, painted gold or copper. The drawer front can be of jig-sawed Masonite or plywood. The letters can be either glued or nailed in place on the nameplate which is screwed on the drawer from inside ("Z" in the drawing).

The only rabbeting necessary on the drawer is the sides to the plywood bottom, with the subfront's width the same as the back.

To lock the drawer, drill either a 9/32" or 17/64" hole through the case's floor and panel ½" deep into the drawer's subfront ("Y" in the drawing) for a ¼" dowel. To get into the drawer, a handy place to store ammunition, the framed glass door has first to be opened

(*Continued on page 45*)

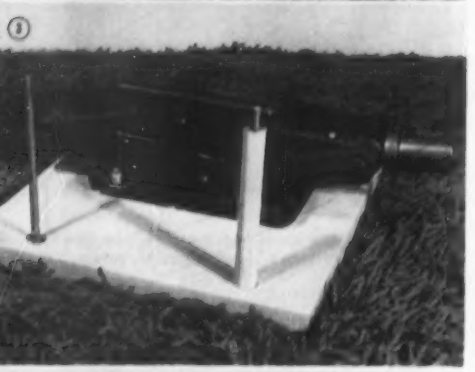


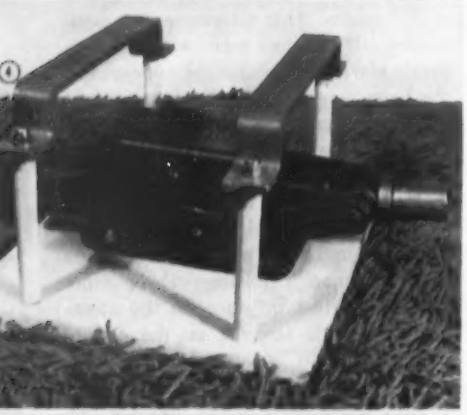
From surplus metal and parts you can make this $9.80

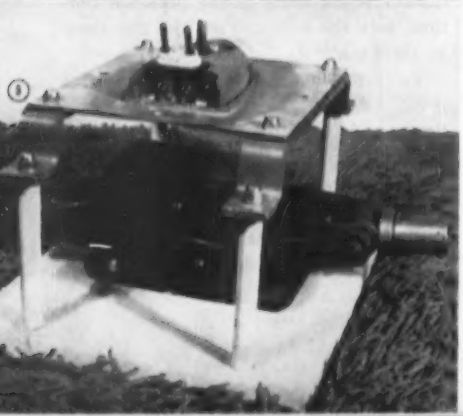
Rubber-Stamp Machine

By Cortland C. Doan

Abraham Lincoln High School, San Diego, California







THIS project is not a student project, but an instructor project. Rubber stamps and rubber plates play a large part in the graphic-arts industry. As a result, the operations and principles involved in the making of these stamps and plates should be taught to our graphic-arts students.

To do this would usually involve considerable expense. This project has been devised to eliminate most of the expense, and still teach the operations and principles of stamp and plate making.

The machine pictured in this article was built from surplus metal and parts. Its total cost was $9.80. The actual design can be modified or improved by the individual builder, without changing the basic operating principles. The size may be altered also to meet the requirements of the individual builder.

This particular machine will take a maximum of about 3″ x 5″ of type matter. This amount has been found to be adequate in a school-shop situation, but certain factors may make it desirable to have a larger machine.

The first thing we considered was the base. Aluminum was found to be too expensive and steel too heavy. Three-quarter inch plywood was finally selected.

The second consideration was the lifting mechanism. A scissors jack was chosen mainly because of its low overall height. The value of a mechanical jack is that the pressure being applied can be felt more readily than in a hydraulic jack. This saves many type forms from heavy-armed students.

A two-hour search through a surplus store fulfilled the third consideration, which was a framework for the machine.

The first operation was to lay out and drill the holes to mount the jack. The jack was located so that the top platform would be very nearly centered under the heating element. The next step was to lay out, drill, and counterbore the holes for the four corner posts (Fig. 1).

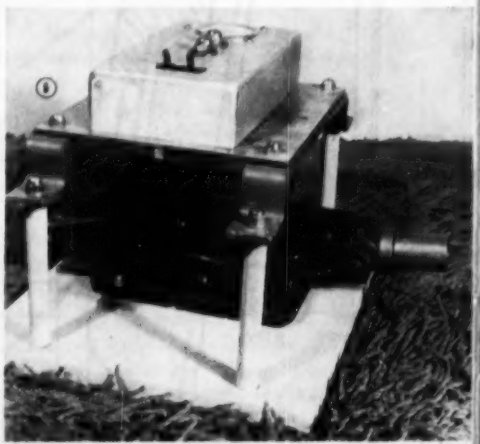
These holes were counterbored to eliminate the possibility of the posts shifting when pressure was applied to the jack. The holes in the base were also counterbored on the bottom to make the nuts flush with the bottom surface.

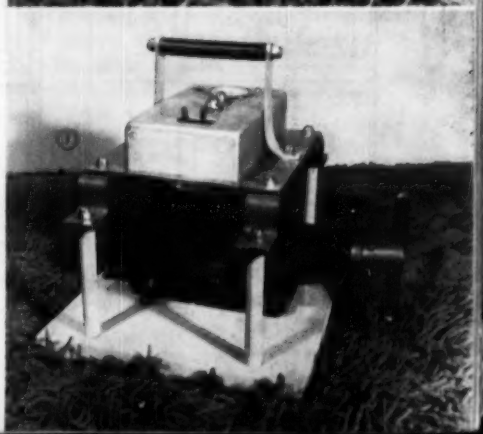
After the jack was mounted in place as shown (Fig. 2), the four corner posts were cut. The stock used for the corner posts was a phenol material used in aircraft. The reason for using this particular material was because it does not transmit heat readily. Metal tubing can be used though, and perhaps is more easily obtained. The corner posts were then mounted (Fig. 3).

The next operation was the forming of the top plate brackets. These were formed so that the corner posts could be kept short for stability. The rise in the brackets also gives more working space between the jack and the heating plate. The brackets were then mounted (Fig. 4).

The next step was the mounting of the heating element and top plate (Fig. 5). The element used in this particular machine was an old flat-iron element. If the machine is to be built any larger than the one shown, it would be advisable to find an element for the specific machine.

The temperature for both the mold





and the rubber must be kept between 300°F and 325°F. This may be done with a thermostat and an oven temperature gage mounted close to the element.

The element was then attached to the top plate with two studs. When the studs were screwed into place, they were ground flush with the bottom of the plate. The stud holes are not shown on the plans because they will differ with other elements.

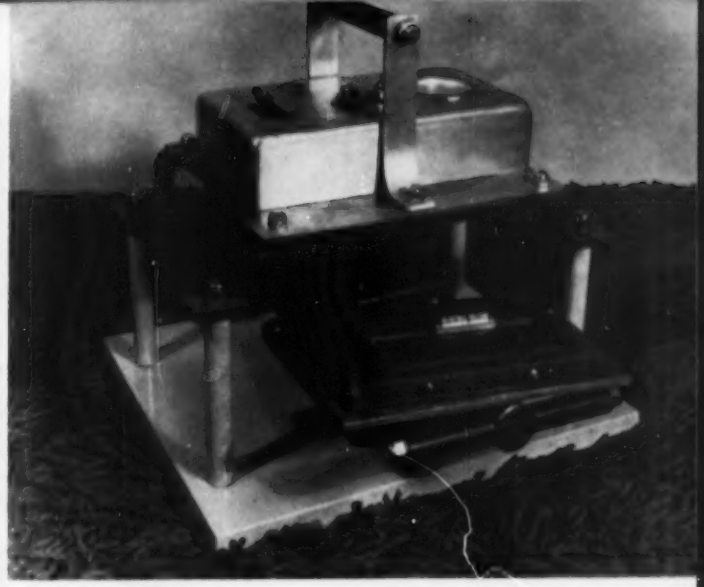
The heating element cover (Fig. 6) was taken from a surplus radio outfit, but a similar cover may be formed from sheet stock with little trouble. Also shown (Fig. 6) is the oven temperature gage mounted almost directly over the heating element.

The handles (Fig. 7) were the last items to be added. Phenol tubing was used for both the top handle and the jack handle, but here again metal tubing may be substituted and still serve just as well.

The chase plate and chase (above) will be left up to the individual builder because of the size requirement. The chase shown is a Kelsey 3 x 5 chase.

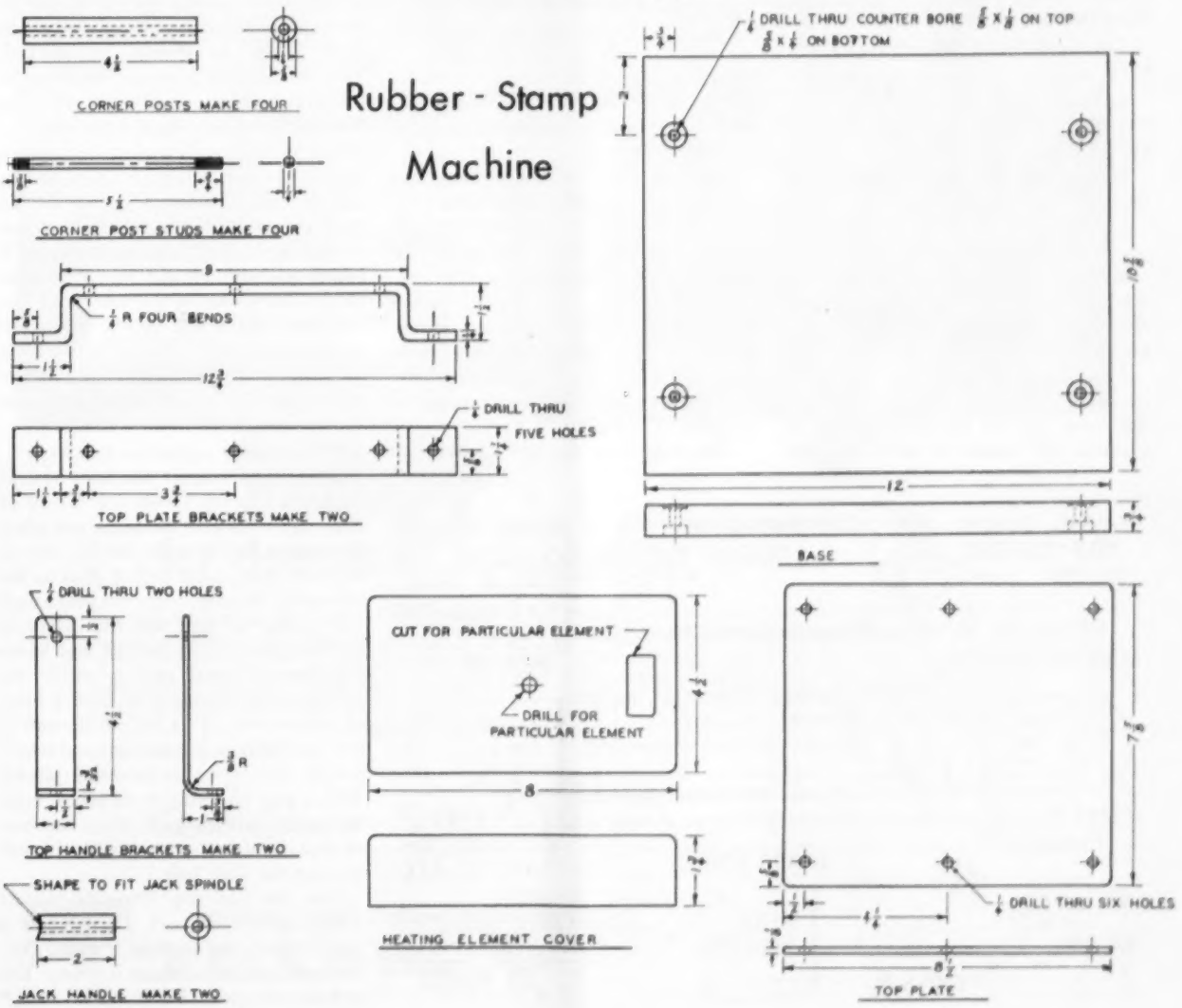
The chase and plate are used together to make the mold from the type, but the plate alone is used to make the rubber impression.

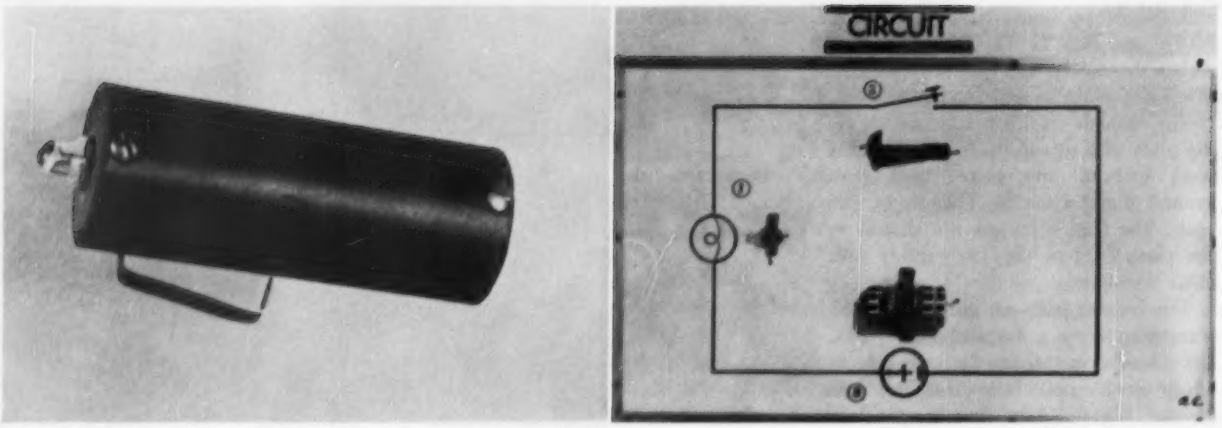
Now, with a little time, patience, and effort you can have that rubber-stamp machine you have been wanting. ★



The finished product: a rubber-stamp machine (right) ready for use with type chase, and chase plate.

Rubber - Stamp Machine





A finished single-cell flashlight (left) and a schematic drawing (right) showing the simple circuit. This project is popular because it is useful.

It's fun and it's useful

Single-Cell Flashlight

By Raymond Casey

Woodrow Wilson Junior-High School
San Jose, California

PROJECTS that produce motion, light, heat, or sound generally fascinate boys in the electrical shop. This one-cell flashlight has intrigued seventh- and eighth-grade boys in my electrical shop for years. It's not a difficult project but it does offer the lads a challenge. Also, it makes a nice take-home project, something that can be used around the house.

The objectives of this elementary electrical unit are:

1. To develop an understanding of the important parts of a simple electrical circuit.

2. To draw the simple circuit of the flashlight, using proper symbols.

3. To introduce students to such basic electrical units as amperes and volts.

4. To develop in the student a need for related information concerning dry cells, electric lamps, and construction materials.

Basic hand tools are all that is required—besides materials—to make this flashlight. The job can be simplified by making "V" blocks to hold the fiber tubing during the layout, drilling, and assembly operations. (The tubing is the flashlight proper.)

For some hints on construction, let's start with the case. It is made from 1⅛" (outside diameter) vulcanized fiber tubing, 3" long, with 1/16" thick walls. The pieces are cut to length on a table saw. The end plates are made from 1" wood fiber rod. Starting with the top plates, drill a ⅜" hole in the middle of it to receive a #112, 1½-v prefocused bulb. The bottom plate (note the drawing) is a simple, 1" plug.

Note that there are two openings in the back of the case. One is merely a slot and the other a circle, both are to receive an end of the contact spring. The slot is made by drilling three #45 holes side by side and filing them rectangular with a bit file. The ¼" circular hole is 1⅜" from the lamp end.

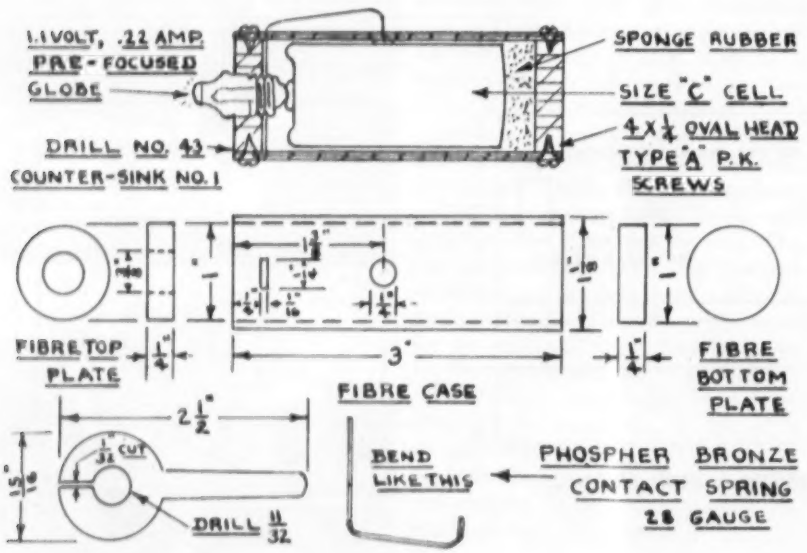
The switch contact spring should be made from 28-gage spring copper or hard brass. It should be marked, punched, and cut to shape as shown in the drawing (lower left corner). The bending is done during the assembly.

The "C" cell, the size that is appropriate for the case, should be prepared as follows: First, measure ⅞" from the positive end. With this point as a center, remove a ⅜" x ½" section of the cardboard case with a knife. Scrape the case bright and clean. If the cell is of the steel-case type, it will have to be bonded on the bottom with a drop of solder from the center to the side of the case. The case should also be scraped bright and clean ⅞" back from the positive end.

The assembly operation follows:

Bend slightly apart the lamp slot of the contact spring (lower left corner of drawing) to receive the lamp, and place the tongue end through the ¼" slot in the fiber case. Insert the top plate in the top end of the case. Place the prefocused bulb in the ⅜" hole that was drilled in the top plate. Insert the cell and locate the cleaned metal section under the switch contact spring hole. Stuff a piece of foam rubber, 1" x ⅝", in the end of the case. Add the bottom plate and secure it with selftapping, countersunk screws. With a pair of needle-nosed pliers, bend the contact spring back along the case so that it makes contact with the cell through the little hole.

Now, the final step. Press the contact spring against the cell. Do you get a light? Yes? You've done it right. No? Needless to say, something is wrong. You will have to go back and check. ★



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An economical technique for teaching

Leather Identification

By Edward R. Roberts
Whittier High School, Whittier, California

ECONOMY—a new word to the nation's solons, judging by the daily news reports—is an old one to industrial-arts teachers. Its eternal quest by many in our fraternity has had anything but a tranquilizing effect on their persons. So, here's an idea that might save you from a little agony.

We often stress the importance of "how to make" a project but quite often neglect the importance of knowing more about the names of tools and materials that go into this "how-to-make." Here is a simple educational trick that will enable handicraft teachers to teach the many and varied kinds of leather used in their shops.

This is the way the device works:

On standard notebook-size sheets of plain paper ditto circles for pieces of leather and leave space under each for an identification label. Once each week, or whichever time period best suits your schedule, a short commentary is made on the different types of leather. Samples of leather, 1" or 1¼" in diameter, are cut with a bag or gasket punch. Scrap, generally available free from supply houses for the asking, is the thing to use. (We must think of economy, you know.)

On a separate sheet of paper the boys should keep notes regarding the origin, cost, and specific uses for certain leathers.

As the samples of leather are handed out, the boys should then paste them over the circles on their dittoed sheets and carefully identify each. A large "mock up," with 4" circles of leather corresponding to those that will be talked about, should be mounted on one of the walls so that the boys will have something to study before the shop-talks.

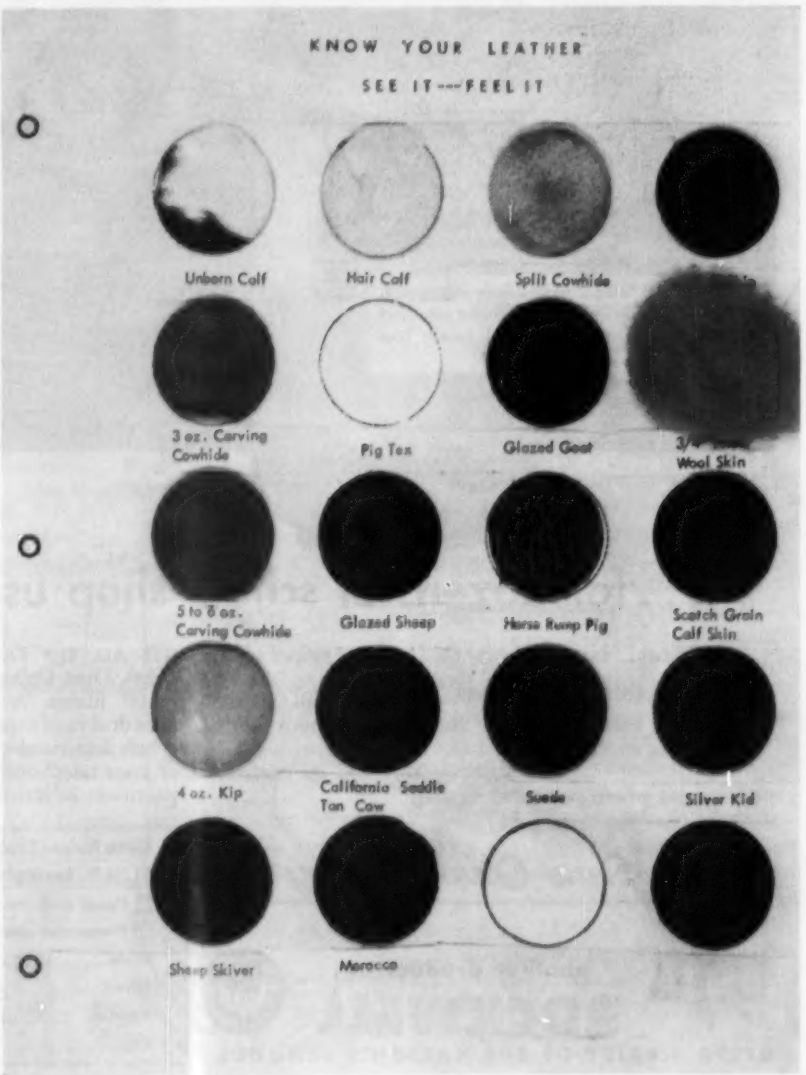
The way students have accepted this particular kind of instruction has been fascinating. The note-book page as it is used becomes to them something akin to a coin collection. They look forward to each week's shop-talk to receive and paste on their sheets the circles of various leathers.

To test the effectiveness of this means of learning leathers, any number of simple tests can be devised, one of which follows:

Take pieces of the same leathers that have been discussed in class, punch holes in them, number them, and thread them on a large key ring or thong. Pass the selection around to the students, who have listed the same numbers on their test papers. Beside each number on their sheets they can then write the proper name of the leather and any other pertinent information about which you want to test them.

The importance of this suggestion is two-fold: it considers another aspect of project making, that is, the materials that go into a project; and it's economical not only in terms of materials but also time, which is growing in value. ★

A standard loose-leaf page showing many kinds of leather pasted in place and carefully identified. One of the most popular pieces in this collection is the fuzzy piece of wool skin, second row at right.



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Walnut or mahogany can be used for dark finishes and red oak for blond finishes for these tables.

Ninth- and tenth-graders made these

Contemporary Coffee Tables

By Roland Bacon

George Washington High School, Danville, Virginia

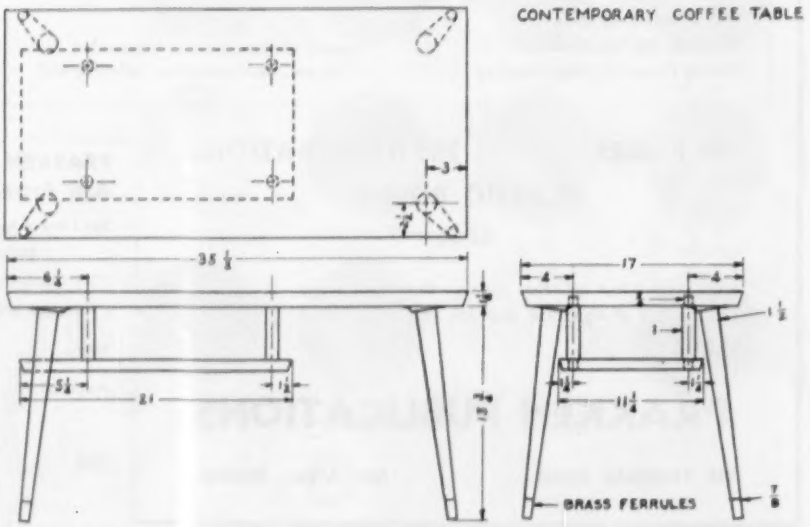
THESE contemporary coffee tables have been constructed successfully by students in my machine woodworking courses at the ninth- and tenth-grade level. The tables are pleasing from a design standpoint and fit into most modern interior furnishing arrangements.

The finishes can be varied to meet the requirements of the home for which they are planned. Some boys made use of dark woods, such as walnut and mahogany, and finished them to match other furnishings in their homes. Others preferred to use red oak and finished the tables with the newer blond and "woodsy" finishes which are characteristic of some contemporary styles.

We found that the best method to bore holes for the dowels which hold the magazine shelf to the top was on the drill press. The positions for the holes should be laid out on the bottom of the shelf after which the top and shelf are clamped together in their proper positions with handscrews. The holes are bored simultaneously in both pieces, thus assuring perfect alignment. The depth stop on the drill press should be adjusted to prevent boring through the top.

The metal angle plates for fastening the legs to the top and the brass ferrules may be obtained from craft supply houses. A system using angle blocks of wood and a dowel turned on the top end of the legs may be used in place of the metal plates.

The completed table is an attractive and useful piece of furniture which most parents will welcome in their homes. ★



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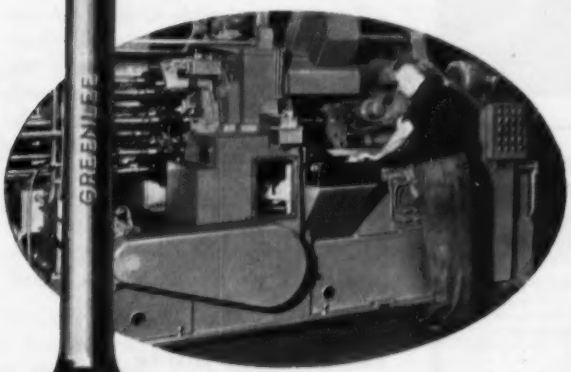

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	160, 250	190
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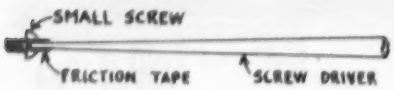
Tape Will Do It



Place a bit of friction tape around the tip of a screwdriver, as indicated, the next time you have a delicate job to do. Make sure the fit between the tape and the slot in the screwhead is tight. This method is particularly good for inserting a screw in a tight spot if you do not happen to have either a magnetized screwdriver or one with a clip on it.—*W. F. Schaphorst, Newark, N.J.*

Cups for Glue

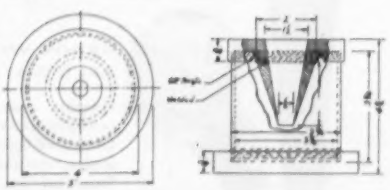
Flat-bottom nonwaxed paper cups are ideal for mixing casein or plastic resin glue. We use the 2-oz. variety. The advantages are: limits the amount of glue mixed and reduces waste; a sharp-edge stick is handy for removing excess glue with the remaining glue drying fast and chipping off, leaving the cup clean for further use; eliminates "soaking" of hard containers because the cups can be thrown away; easy storage; and tends to eliminate sink clogging because the container isn't soaked in the sink or under the faucet.—*Milton A. Glenn, Prairie View, Texas, A & M College.*

Guard Compels Safety

I believe that we can eliminate the danger that is present when a boy forgets to remove the chuck wrench from the chuck before he starts his lathe with the guard shown in the accompanying picture.

Using this type of guard, the student will find it impossible to start the machine unless he uses the same chuck wrench by inserting it through the square hole in the guard. The wrench will then be out of harm's way. After the pattern has been established—removing the chuck wrench before starting the machine—the guard should be removed so that actual trade practices can be followed.—*Raymond Greenberg, Brooklyn High School of Auto Trades, Brooklyn, N.Y.*

The Funnel's Inside



Although this brazing flux container is rather elaborately designed of metal, it can be altered to suit your particular needs and still eliminate flux problems in your shop. It avoids excessive spilling, and its additional weight makes it diffi-

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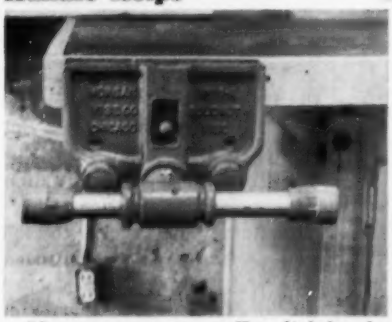
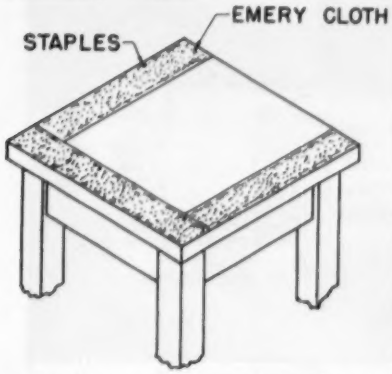
cult to knock over. It has the advantage of the tapered hole which is easy to hit. In your variation, though, be sure to retain the recessed funnel because that is what makes it so practical.—*Jack T. Duvall, Washington Trade School, Detroit, Mich.*

Handle Helps



If you want to muffle slightly the sound of rattling vise handles and lessen the danger of pinched fingers, try this neat little trick. Take a couple of pieces of ¾" electrical, thinwall conduit and work each one into the vise handle holder. Work rubber tips (crutch tips) onto the ends. The tips stay on quite well by themselves, but the application of some automotive trim cement insures their staying where placed.—*S. L. Nay, Intermountain School, Brigham City, Utah.*

Pointing Table



One way to avoid pencil scrapings in the drawing room from soiling drawings and clothing is to place a small rectangular table with a stapled emery-cloth border near the pencil sharpener. The table should be about waist high. This would eliminate individual sandpaper or emery-cloth paddles. —*James F. Becker, Shields High School, Seymour, Ind.*

Short-Cut to Grading

A fast method of grading certain types of drawings for accuracy, one which has worked out well with us, follows: The instructor draws the problem on tracing paper. As students turn in their versions, he simply lays his drawing over the student's and determines the errors. This method works particularly well with isometric drawings.—*Dale A. Davis, Oregon City Senior-High School, Ore.*

Instead of Engineers Scales

In mechanical drawing a student is sometimes called on to make a drawing using decimals. If drawing tables are equipped with both architects' and engineers' scales, some students become confused and use the wrong scales.

To get around this, I give each student a small piece of drawing paper divided into tenths, which is much easier to use than a 12" scale as it takes up less space on the board. A large piece of drawing paper can be ruled off and the lines inked in. These larger pieces can then be cut in smaller pieces, each big enough to do the desired job.—*Glenn H. Osborne, Ottumwa High School, Ia.*

Add a Bit of Varnish

Linseed oil mixed with equal portions of spar varnish makes a better looking finish on a gun stock than oil alone. Total application time is much shorter, too.—*Dorsey Watts, Belington, W. Va., High School.*

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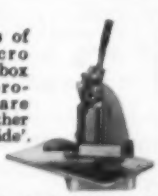

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Abrasive comments from that doughty Scot, Tom Diamond, former head, Department of Vocational Education, University of Michigan, Ann Arbor.

Cherchez la Femme

MAN has a habit of sticking out his chest and announcing to the cock-eyed world that man is master of the universe. However, informed people recognize that this is merely a lot of baloney. If you reflect on what happens to this chesty individual when he arrives at his home in the wee small hours and faces the little woman who, with great specificity, tells him what kind of weasel he is, you would conclude that the idea that women belong to the weaker sex is fallacious.

There was a period in history when woman was considered an unimportant member of society. She walked timidly behind her lord and master, and she bowed uncomplainingly to the slightest whim of the Great I Am. But the world has changed. The timid little woman has become a force in world activity, and can surpass her man contemporary in many areas of occupational life. We still have a few who lag behind, but, by and large, woman has made a place for herself in human affairs which any unbiased person will admit is superior to that of her boy friend.

Men can be found who are ready to admit publicly that they no longer rule the roost in the family home. And where is the man who is so naive that he believes he is the bright fellow who selected his mate to sail the troubled sea of matrimony? Why, the little woman had him tagged long before the idea of marriage ever entered what he uses for a head.

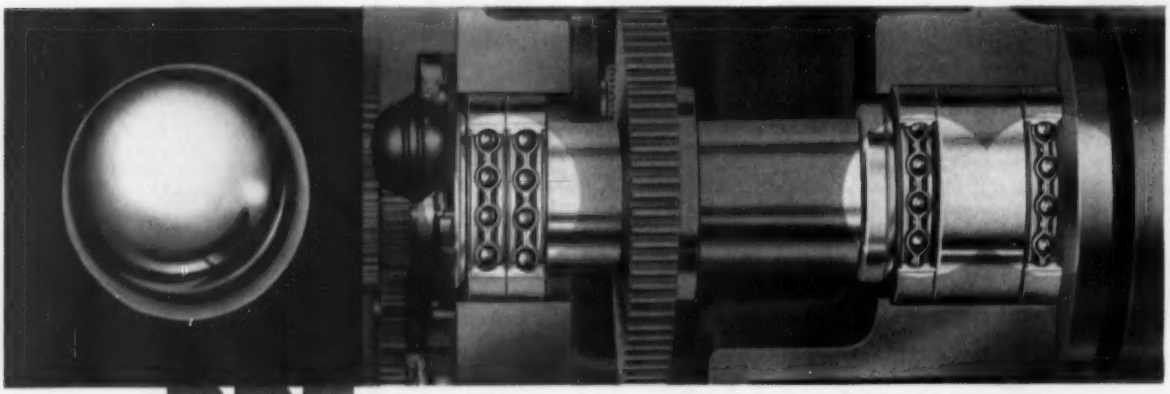
In the world of work, woman has been making progress in being accepted as a qualified worker. This progress becomes evident when we find that, according to the U. S. Census Reports, there were 4 million women employed for wages in 1896, while, in 1956, there were 22 million women gainfully employed. Moreover, the number employed in 1896 constituted only one-sixth of the total working force in the country, whereas in 1956 this proportion had been increased to one-third.

Judging by these data, the continued growth of the female working force is assured. As a matter of fact, recent estimates by the Census Bureau indicate that if the rate at which female participation in paid employment continues to increase, the number of women gainfully employed may pass the 33 million mark by the year 1975.

What significance do these figures have for people in the field of vocational education? Those who are familiar with the Smith-Hughes law may recall that the provisions of this act were designed to assist in the promotion of vocational education. There are no indications in it that the training provided should be enjoyed exclusively by the male sex. But what has happened since 1917? Most of the planning for this type of education has been done *by* men, and *for* men.

Notwithstanding this block to the training of women, they have continued to progress and, in recent years, have been pursuing us into many areas of employment where men have long felt they were free from female domination. Not only are they being employed in these areas, but, unbelievable though it may seem, they are doing a better job than we ever thought of doing.

Are we men or are we mice? How long must we stand for this invasion of our vested rights? I fear we have waited too long to do much about it, and the situation is likely to become more acute, rather than less.



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Of course we could fight these interlopers. But any intelligent man recognizes the futility of fighting a woman. In the first place, in civilized communities it is considered unethical to fight women. Second, you can't win anyway.

Since fighting them would show evidence of poor judgment, the only alternative is to join the march of progress by encouraging their efforts to expand their areas of employability. As we strike our war flag and unfurl our flag of truce, let us establish the principle that every occupational area shall be open to men and women, on an equal footing, provided the areas do not lie outside of the physical ability of women.

But that is not enough. We might as well go all out for this idea, since we believe in it. We must have more women who are informed concerning the occupational needs of women on our vocational planning boards. We must find out specifically what jobs women are doing, or can do, effectively. And we must provide school facilities with which to provide training for these jobs.

If we believe sincerely in equal educational opportunity, we cannot afford to do less. Moreover, if we become active in promoting a broader conception of vocational education for women, we will be joined by a host of women who, for years, have dedicated their lives to the same cause.

No one enjoys being compelled to do something about a problem. But this cause is a just one and the girls are getting stronger every day. So, boys, you had better become active in promoting it. Time is running out fast, and they will lick you in the long run—sure as shooting. Go *cherchez la femme!* ★

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happenings in industrial education

Florida Gets Rare Books

COLLECTIONS of two of this country's pioneers in vocational education—the late J. C. Wright and Lindley H. Dennis—are now in the library of Florida State University, Tallahassee.

The material, consisting of more than 400 books, periodicals, and federal and state documents on vocational education, includes rare books and reports documenting the early beginnings of vocational education in this country, telling historical events and early philosophies of pioneers in this field. As a result of these additions, Florida State University now claims one of the finest university libraries of its kind in the country.

Dr. Wright was assistant U.S. commissioner of education in charge of vocational education from 1922 to 1946. He died in 1955. Dr. Dennis was a member of the original group which drafted the Smith-Hughes Act and for 17 years was executive secretary of the American Vocational Association. He died in 1955.

The books were the gifts of Mrs. L. H. Dennis, widow of the educator, and Mrs. Nadia Zimmerman, daughter of Dr. Wright.

*strictly personal

WILLIAM HEASLEY and PETER SLUSARSKI have been appointed to the industrial-arts department at Kent State University, Ohio. Mr. Heasley formerly taught at Stow, Ohio, and Mr. Slusarski was on the faculty of Candor Central School, Candor, N.Y.

SHERRILL D. MCMILLEN, 25-year veteran in the field of vocational education, has been named to succeed JOHN M. LOWE as state director of vocational education in West Virginia. Mr. Lowe, who retired on August 31, had held the office since 1944. Mr. McMillen was formerly state supervisor of vocational agriculture and state advisor of the FFA since 1952.

HAROLD E. TAYLOR assumed his duties as principal, George Westinghouse Vocational and Technical High School, Brooklyn, N.Y., September 1.

EUGENE BUCK, formerly of Aberdeen, Neb., High School, has been appointed head of the graphic-arts department at Nebraska State Teachers College, Kearney. ORA LINDAU of Kearney public schools has been appointed head of the college's woodworking department.

WALTER BURDETTE has accepted the position of head of the division of technology at Arizona State College, Tempe. Mr. Burdette previously was on the industrial-education staffs of Ball State Teachers College, Muncie, Ind., and State Teachers College, St. Cloud, Minn.

FRANK W. SCHMITT, head of the John Burroughs School department of industrial arts for 21 years, died of cancer recently in St. Louis. He was a graduate of Warrensburg State College and the University of Missouri.

Two new faculty members have been named to the industrial-education faculty at Buffalo State Teachers College, N.Y., and two others have returned from leave.

They are:

WILLIAM M. BOWERS has been appointed assistant professor in the graphic-arts department. He formerly taught in the Arlington, Va., public schools.

REX MILLER will teach electricity and electronics. He taught formerly in the Air Force Technical Schools for Radio and Radar Mechanics and in Iowa public schools.

H. GENE STEFFEN returns to the staff from his sabbatical leave. He spent the time "trailering" 18,000 miles through the United States and Mexico observing industrial-arts and crafts programs in the two countries.

OWEN HARLAN has returned to his teaching position after serving for two years as consultant to the Department of Education of the Union of Burma. His chief responsibility there was to aid in the development of a teacher-training program at the State Training College in Rangoon.

DONALD C. CAMERON, former state director of vocational education in Nevada, died at his home in Carson City following a lengthy illness. Following his retirement in 1950, Mr. Cameron was a consultant to several large mining corporations in the West.

DONALD E. VANDEGRAFT has been appointed Western representative of the McKnight & McKnight Publishing Company. Formerly an industrial-arts teacher at El Monte, Calif., he will serve California, Washington, and Oregon.

New officers of The William Hood Dunwoody Industrial Institute, Minneapolis, Minn., are: JOSEPH R. KINGMAN, JR., president of the board of trustees; JOHN A. BUTLER, director of the institute; and WALTER F. SAHLIN, associate director of the school. Mr. Butler, a Dunwoody graduate, attended the University of Minnesota and Colorado State College, and has been assistant director of the school since 1945. ★

Workshop at Stout

INDUSTRIAL-ARTS teachers from three states attended an industrial-arts workshop at Stout State College, Menomonie, Wis., on October 4.

Demonstrations and talks in four fields of industrial arts were given. David P. Barnard, head of Stout's audio-visual center, spoke on "New Teacher-Made Audio-Visual Production Techniques," Martha Ruth Amon, also of Stout, discussed ceramics. "Gem Cutting and Polishing" was the topic of Guy Long of Chippewa Falls. Marvin Kufahl of Stout explained new techniques in metal spinning.

George Soderberg, associate professor of industrial education at Stout, was general chairman of the event.

Six Educators Honored

THOMAS DIAMOND, chairman of the editorial board, SCHOOL SHOP magazine, and former head of the industrial-education department, University of Michigan, was one of six educators who received the AVA Outstanding Service Award at this year's AVA convention. He will receive the award at a formal presentation later this year from the Michigan Industrial Education Society. Professor Diamond has just returned to this country after a three-months visit in England and Switzerland.

Other educators who received the AVA award were Franklin J. Keller, New York; Charles W. Sylvester, Maryland; Beulah I. Coon, District of Columbia; Herbert M. Hamlin, Illinois; and Robert J. Bishopp, Wyoming.

The awards are made annually to not more than six professional educators for "service beyond the call of duty to vocational and practical-arts education."

Printing Teachers Elect

THE Printing Teachers Guild of New York, at a recent meeting in the offset showrooms of American Type Founders, New York City, elected Leo Hochwald of the New York School of Printing to be president for the coming year.

John M. Fontana, graphic-arts instructor at Somers Junior High School, was named vice-president. Max R.

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Kirshner of the New York School of Printing was elected treasurer, and Gerald J. Mallon of Westbury High School was named secretary.

New Shops in California

PLANS for new shops in two California colleges are now being drawn up.

At San Francisco State College, six new shops for the industrial-arts department are being planned. Construction is expected to begin next spring and the completion date has been set for the fall of 1959.

At San Jose State College, Angelo Centanni has been relieved of teaching duties to devote full time to drawing plans for new buildings for the San Jose campus, including a new industrial-arts plant.

The Ship Elects Officers

WILLIAM B. JENNISON, advertising manager of *School Arts Magazine*, has been elected captain of The Ship, to serve through 1959.

Other officers are: Harry E. Masters, L. S. Starrett Company, first mate; Paul Van Winkle, Charles A. Bennett Company, second mate; C. H. Clawson, Brodhead-Garrett Co., log officer; Lois M. Corbeil, A. B. Dick Company, purser; T. C. Linacre, radio officer; and Leonard A. Hehner, American Pencil Company, steward.

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Nevada Assn. Reorganized

HOWARD HUTCHINGS of Churchill County High School, Fallon, was elected president of the Nevada Vocational Teachers Association for the coming year, following a reorganization of the association under the newly adopted constitution. J Myron Partridge, Las Vegas, was the retiring president.

Other current officers are: Mrs. Evelyn Bachelor of Fallon, Harry Wolf of Elko, Keith Lee of Reno, and John Caserta of Reno, all vice-presidents; and Mrs. Ruth A. Paget, state supervisor of business education, secretary-treasurer.

Ohio Supervisors Meet

INDUSTRIAL-arts curriculum was the major topic discussed at the annual fall meeting of the Ohio supervisors of industrial arts in Warren, Oct. 15-16.

To promote closer liaison between the public schools and the teacher-training institutions, the industrial-arts staff of Kent State University presented a report on its teacher-training program.

A committee composed of Phil Waldeck, state supervisor; Joy Mohrhardt, Toledo; and W. K. Dunton, Warren, was named to select a state-wide industrial-arts advisory committee which would study the industrial-arts curriculum and also develop closer liaison with teacher-training institutions.

Bill Mason, Cleveland supervisor of industrial arts, spoke on the national industrial-education organizations.

The 1958 meeting will be held in Sandusky in October.

Other New Buildings

APPALACHIAN Teachers College, Boone, N.C., has received an appropriation of $300,000 from the 1957 North Carolina General Assembly for an industrial-arts building and equipment.

Bemidji State College, Minn., also is in the midst of planning a new industrial-arts building. Bemidji now offers master of education degrees in industrial-arts education.

Convention Calendar

Industrial Teacher Conference, Texas A & M College, Feb. 21-22.
Illinois Vocational Association, Hotel Jefferson, St. Louis, Mo., Feb. 27-28.
New Jersey Vocational Arts Association, Hotel Berkeley-Carteret, Asbury Park, Mar. 13-15.
California Industrial Education Association, Long Beach, Mar. 14-15.
Ohio Industrial Arts Association, Neil House, Columbus, Mar. 27-29.
New York State Vocational and Practical Arts Association, Hotel Syracuse, Syracuse, April 10-12.
Michigan Industrial Education Society, Civic Auditorium, Lansing, April 17-19.
American Industrial Arts Association, Hotel Statler, Boston, Mass., April 29-30.

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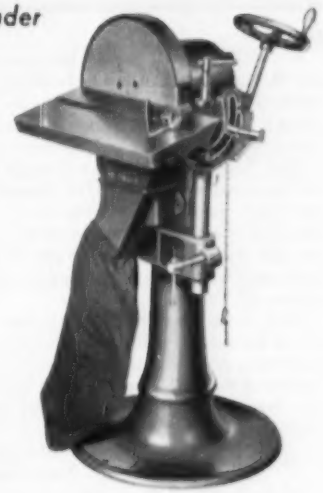

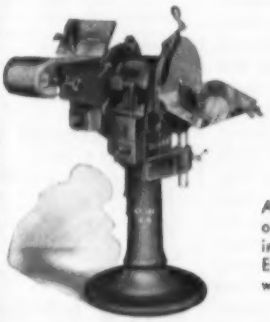

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IN THE *Morning Mail..*

[Brief comments about SCHOOL SHOP and the field it serves are invited. Address the Editor, SCHOOL SHOP, Ann Arbor, Michigan.

Dear Sir,

It was difficult to believe my eyes when I saw the cover of the October issue of SCHOOL SHOP. The framing model shown has a most glaring error in construction technique. I seriously doubt if there is a community in the United States that allows 2 x 4 single window and door headers laid flat. The window on the back right side appears to be over 6' wide, a distance which would call for 2 x 6's placed on edge. For authority consult the FHA minimum-standards tables or the building codes of almost any city.

Such errors only add fuel to the low opinion of the knowledge of teachers held by so many tradesmen in various areas. Of course, the real victims of this error are the young fellows who are being fed misinformation and incorrect methods and techniques.

Frederick Hop,
Marysville, Mich.

(Editor's Note: Reader Hop is to be commended for his keen observations and comments. However, this particular set-up was not chosen by SCHOOL SHOP*'s editors as an ideal vocational-training device but rather as something to be contrasted with a situation where T & I students did their work under actual conditions on an honest-to-goodness "real" project as described in "Shop on Wheels" by William A. Davis, page 14 of the same issue.)*

Dear Sir,

Enclosed are coupons for teaching aids from your October, 1957, issue. Thanks for a swell magazine and this special service.

Donald B. Freeman,
Johnson Junior-High School,
Cheyenne, Wyo.

Dear Sir,

Please find enclosed several coupons from October, 1957, issue of SCHOOL SHOP. I appreciate the service rendered by your magazine and look forward to receiving it regularly. It serves a fine purpose.

Chester B. Ainsworth,
East Texas State Teachers College,
Commerce, Tex.

Dear Sir,

In order to take advantage of the splendid offers you make in the Shop Teachers Service in the October, 1957, issue of SCHOOL SHOP, we are enclosing several coupons.

M/Sgt. K. A. Gjengdahl,
U.S. Disciplinary Barracks,
Fort Leavenworth, Kan.

Dear Sir,

I'd like to call attention to the fact that the boy pictured on the cover of the September, 1957, issue is operating a shaper and not a milling machine as stated.

Walter Haynes,
Cedar Falls Public Schools, Iowa

Dear Sir,

I looked with interest at the cover story on the September, 1957, issue of SCHOOL SHOP magazine. Am I mistaken or is that a shaper on which the young man is working? If so, who goofed? Not you, surely.

Okey E. McCourt, Supervisor,
McDowell Vocational School,
Welch, W. Va.

(Editor's Note: Yes, Readers Haynes and McCourt, we goofed. It's a shaper and not a milling machine that the lad is working on. And, this is how we feel about it. ★

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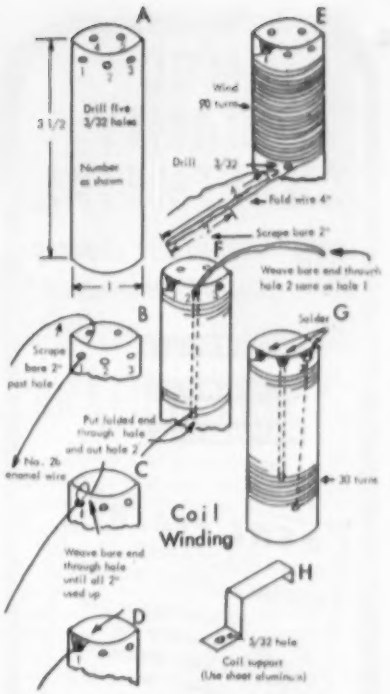
Coil Winding Simplified

By A. B. Crawford

Radio Instructor, Herbert Hoover High School, San Diego, California



COIL winding is considered by many radio instructors an essential part of building a simple radio receiver. However, there are a great many methods of winding and terminating coil ends as well as coil forms. For inexpensiveness and convenience, the method illustrated has proven satisfactory.

Terminals for shop-made coil ends are generally a problem for the beginner. Solder lugs fastened with small machine screws are good but generally consume large quantities of lugs and screws. Merely bringing out extensions of coil wire makes an unsatisfactory appearing job. In addition, the connections are difficult to change or remove from the coil. We've tried this but it has not proven as good a technique as the one shown here. Its simplicity is enough to recommend it for use in your shop.

Details of winding operations are shown in the drawings. Use transparent tape to keep the wire from unwinding when working on taps or the finish end. Care should also be taken when sanding or scraping the enamel from the wire so that the wire will not break.

An ordinary 1" mailing tube, cut into desired lengths with either a coping or band saw, will suffice for coil forms. Dipping each form into shellac or sanding sealer prior to winding will strengthen the tube considerably. This will facilitate drilling or punching the terminal holes at one end of the coil.

The number of coil turns indicated in the drawings are for use with a standard 365-mmfd tuning condenser. Wire size can be varied without distorting tuning too much. The tap is for the antenna connection nearest to the ground and the Q of the coil is around 100, which is not bad considering the form material. ★

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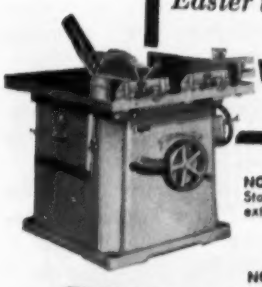

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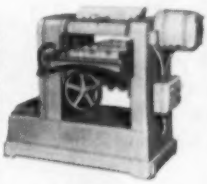

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What's Your KGD*?

By Norman C. Pendered

Associate Professor of Industrial Arts, Pennsylvania State University, University Park

SO you know about shop demonstrations? Well, take this self-quiz and see just how you do stack up. Check your responses with the answers on page 45 and then find your standing on the chart below.

Number Right	*This Means:*
25	You're tops!
23-24	You're plenty good.
20-22	You're doing okay.
18-19	Just plain average, better brush up.
17 or less	You need a refresher course!

Circle the *T* if the statement is true or the *F* if it is false.

T F 1. It is safe to assume that the average student understands all technical terms and nomenclature used in the demonstration.

T F 2. Spur-of-the-moment group demonstrations are usually superior to those planned in advance.

T F 3. A summary of main points is a weak means to conclude a demonstration.

T F 4. It is important to make certain that all students can see and hear throughout a group demonstration.

T F 5. In a group demonstration, it is important to connect previous learning with present learning.

T F 6. The instructor should use the demonstration to impress the class with his manipulative skills.

T F 7. Materials, supplies, and equipment should be on hand before the demonstration begins.

T F 8. Visual aids merely clutter up a demonstration.

T F 9. The instructor should look at and talk directly to his students.

T F 10. Individual demonstrations may still be needed even though one well-organized group demonstration has been given.

T F 11. An instructor should ignore pupils whose attention has wandered during the demonstration.

T F 12. Mastery of subject matter is an assurance the demonstration will be successful.

T F 13. The group demonstration should accomplish the greatest good for the greatest number.

T F 14. An exhibition of sloppy workmanship on the part of the instructor in a group demonstration is justified to save class time.

T F 15. The instructor should use his own personal or special tools in a group demonstration to assure good results.

T F 16. The class should be encouraged to answer questions in unison.

T F 17. The instructor should devise means for student application immediately after a group demonstration.

T F 18. Going through the steps or processes one time in a demonstration is always sufficient for a class.

T F 19. Good class control is a prime requisite for a good demonstration.

T F 20. Questioning pupils during a demonstration is an effective means to test understanding.

T F 21. The group demonstration is given to save the instructor's time.

T F 22. It is safe to assume at the completion of the demonstration that the pupils understand and can do what has just been demonstrated.

T F 23. It is important to bring the pupils' senses of touch and smell into the demonstration whenever possible.

T F 24. The instructor should permit students to converse among themselves during a demonstration.

T F 25. Group demonstrations should always be given at the beginning of a shop period. ★

(*For the answers see page* 45)

*Knowledge of Group Demonstrations (unvalidated).

CROW

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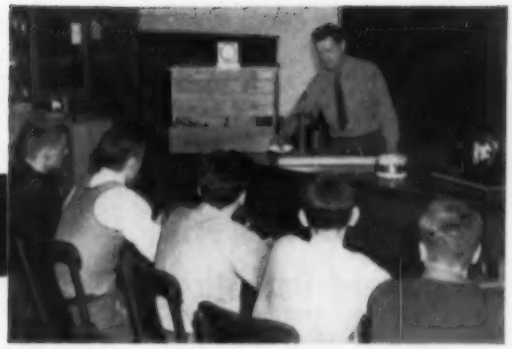

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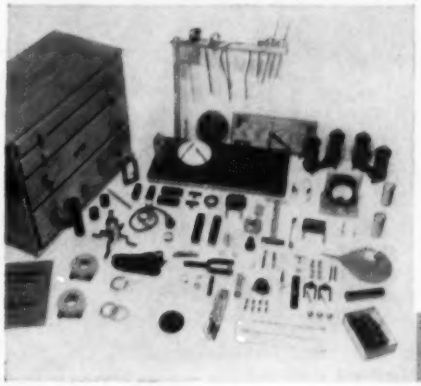

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Project Design

What the industrial designers are doing (One of a series)

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JUDGING from the appearance of many objects for the home, such as the Allan Gould "Compass Chair," manufacturers are finding it necessary to work with several types of industrial materials rather than solely with one. There is certainly no inherent incompatability between wood and metal so the contemporary designer would say, "Why not exploit the favorable characteristics of each and combine them into a unified and interesting design?" In one sense a manufacturer like Allan Gould is running what industrial-arts teachers recognize as a general shop. He is not confining his labors to one area only.

Notice, if you will, the benefits, both mechanical and aesthetic, which are the result of this deft fusing of materials. Coming from a well respected manufacturer, the metal structure will outlast most leg and arm-rest combinations out of wood. Notice the smooth flow of lines which subtly reflect the method of processing both the metal frame and the laminated-wood back and seat. There is also a lightness of appearance which might frighten a stone-age man into sitting on the floor but would not faze anyone who is familiar with steel.

The chair shown is offered in several different ways: maple or walnut seat and back, upholstered seat with wood back, or upholstered seat with upholstered back.

All in all, the chair is well done structurally and aesthetically. Imagine, though, the look on the old Swedish cabinetmaker's face when they brought in a tube bender to help him make furniture.—*Robert A. Tinkham, Associate Professor of Industrial Education, University of Illinois, Urbana.* ★

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Books:

Automatic Record Changer and Tape Recorder Service Manual. (Vol. 9.) Indianapolis.: Howard W. Sams & Co., 1957. Pp. 227. $3.95.

This book, ninth in a series dealing with the subject, provides a comprehensive coverage of 1956 models of record changers and tape recorders.

The index lists all types and models which were presented in the first eight volumes as well as those covered in this manual. A cross-index reference which identifies the makes and models of changers used in various radio and television receivers is provided.

The data presented includes "photofact exploded views," operational data, and service instructions.

Energy. Sir Oliver Lodge. New York: John F. Rider Publisher, Inc., 1957. Pp. vii+54. $1.25.

This is a modernized reprint of a book originally written by the English author. It contains practically no mathematics yet explains complex ideas with word pictures, relating them to daily experiences so that the subject is made completely understandable and at the same time interesting. Illustrations have been added.

Machine Tools—What They Are and How They Work. Herbert D. Hall and Horace E. Linsley. New York: The Industrial Press, 1957. Pp. x+436. $5.50.

This book is an introduction to the fundamentals of mass production—the tools, machines, gages, and methods that make up our modern metalworking industries and automated production lines. It is an enlargement of *The Machine Tool Primer.*

The volume is intended to serve as an aid to college students, technical-school students, and students in machine-shop training courses.

Problems in Mechanical Drawing, First Course. (Second Edition.) A. S. Levens and A. E. Edstrom. New York: McGraw-Hill Book Company, Inc., 1957. Pp. 74. $2.20.

This workbook is designed to meet the needs of a beginning one-semester course. It introduces the student to the use of drawing instruments.

The problems have been designed to enable the student to grasp the theory of shape description. Geometric constructions are introduced concurrently with their application, thus providing meaningful integration. The workbook is keyed to *Mechanical Drawing* by French and Svensen.

Two unique steps have been taken in the manufacture of this workbook: 1) several sheets of high-grade tracing and buff paper have been grouped at the back; 2) each plate is printed on only one side but the printed plates have been folded and bound mechanically and, therefore, do not always appear as the right-hand page.

Cabinetmaker's Manual for Amateurs and Professionals. Whitney K. Towers. New York: The Home Craftsman Publishing Corp., 1957. Pp. 448. $6.95.

This thoroughly illustrated and well-indexed volume is written for the professional woodworker, the amateur craftsman, and for the young man who has not yet chosen his life's work but who might see cabinetmaking as a well-paying trade to learn.

Starting out with a brief history of cabinetmaking, the book covers layout, materials, the use of tools—power and hand—and the problems of conducting a small woodworking enterprise.

The author is a cabinetmaker and woodworking consultant.

Chair and Stool Seating. Peoria, Ill.: Chas. A. Bennett Co. Inc., 1957. Pp. 32. $1.15.

This little volume deals thoroughly with a craft which is not only interesting to do but which produces results that are practical as well as decorative. The various materials considered for chair and stool seating are cane, rush, seagrass, and seating cord.

Despite this craft's demand for a high degree of proficiency, it does not mean it is unsuitable for younger folks.

It is the intention of the book, well illustrated as it is, to explain how basic patterns may be adapted and developed to fit in with the present trend in contemporary furnishing. The book was printed in Great Britain and imported by the Chas. A. Bennett Co.

Tool & Die Drafting. Hoover and Schumacher. Detroit, Mich.: Royalle Publishing Co., Inc., 1957. Pp. ix+184. $3.60. Discount to schools.

This book has been designed for use with high-school, vocational, apprentice, and evening-school classes. The material has been tested in teaching the fundamentals of drafting through the use of "live" tool, die, and fixture parts rather than an assortment of wooden blocks.

Thoroughly illustrated, the book contains 18 pages of ready-reference tables plus a suggested outline of courses for instructors of tool design.

Theodore W. Hoover is a drafting teacher and Herman G. Schumacher is principal and former drafting teacher, Cody High School, Detroit, Michigan.

Tractors and Crawlers. Irving Frazee and Philip V. Eshelman. Chicago: American Technical Society, 1957. Pp. xi+308. $7.50.

This volume covers the tractors and crawl-

ers used in agriculture, logging, road building, and industry, including the many variations in their operational characteristics and their performance.

The book begins with a discussion of the variations among tractor and crawler types and sizes that are available. There follows a treatment of the construction of tractors and crawlers with descriptions of the various parts that go into their assembly.

Each chapter is followed by a "trade competency test."

R-F Transmission (No. 166-8, Pp. 63); **Amplitude Modulation** (No. 166-9, Pp. 56); **Blocking Oscillators** (No. 166-10, Pp. 64); **L-C Oscillators** (No. 166-13, Pp. 66); **Resonant Circuits** (No. 166-16, Pp. 66). New York: John F. Rider Publisher, Inc., 1956. $1.25 each.

These five books constitute a part of a series on electronic technology. The material included in them is organized to give a comprehensive picture of the basic principles governing the various elements covered. Technicians, as well as students who have a background of experience in the field of electronics, will find the books to be helpful in their work.

Blueprint Reading. New York: Arco Publishing Company, Inc., 1957. Pp. vi+242. $3.00.

This is a basic reference work prepared for the needs of technicians, teachers, and students who are concerned with blueprints in their work or studies. It is the result of a cooperative effort on the part of the training personnel of the Navy and the Naval Air Force.

The book includes the uses and kinds of blueprints and an explanation of blueprint language, including lines, symbols, and conventions. A section on layout covers layout tools and how they are used.

A section is provided on wiring and schematic diagrams. Other sections deal with piping systems, welding symbols, and architectural drawing. Each chapter is followed by a list of questions on the material covered in it.

Manual of Instruction for Arc Welding. Cleveland: The James F. Lincoln Arc Welding Foundation, 1957. Pp. 40. 50c.

The booklet is designed to meet the needs of high-school students as a text and as a reference guide. It covers basic welding skills and related information in nontechnical language and is well illustrated with many helpful diagrams. It could be used as a basis for an entire course or as a unit in metalworking or general shop.

Popular Mechanics Farm Manual. Chicago: Popular Mechanics Press 1957. Pp. 223. $3.00.

This volume contains hundreds of illustrated ideas and plans that would be helpful for vocational agriculture students in studying time, labor, and money problems of the farm.

There are directions on how to build and repair tractors, stackers, hydraulic lift trucks, fences, saws, and scores of other items. Special attention is given to the use of concrete in making repairs and improvements around the farm.

Early Electrical Machines. Bern Dibner. Norwalk, Conn.: Burndy Library, 1957. Pp. 58. $1.50.

This book is the history of the development of electrical machines. Thoroughly illustrated with pictures of early inventions and their inventors, it covers roughly the period 1600-1800 showing man's efforts to investigate electricity and its application.

The author is an industrialist active in electrical engineering who also pursues the history of science and technology.

Pamphlets:

Grinding Wheel Simplified Practice Recommendation R45-57 is the new 76-page edition that supersedes the 1947 publication of the Grinding Wheel Institute. This booklet deals with the establishment of standards of practice for shapes, types, and sizes of grinding wheels that are currently in general production and demand. Single copies are free of charge from the Grinding Wheel Institute, 2130 Keith Bldg., Cleveland 15, Ohio.

Manual for Use by Local Graphic Arts Industry - Education Committees describes how to set up industry-education advisory committees, what to do at first meetings, etc. The manual is free to members of the Education Council of the Graphic Arts Industry, Inc. To nonmembers the report, containing sections 1 and 2, is available at $10 per copy; section 3 at $5.00 for each part (7 parts). For additional information, write to the Education Council of the Graphic Arts Industry, 5728 Connecticut Ave., N.W., Washington 15, D.C.

American Standard Identification Code for Diamond Wheel Shapes is the new 13-page code published by the Grinding Wheel Institute. The pamphlet, approved by the American Standards Association, sets forth a system for classifying every type of diamond grinding wheel. Single copies are available free from the Grinding Wheel Institute, 2130 Keith Building, Cleveland 15, Ohio.

Lumber: from Forest to You is a fascinating 32-page booklet published by the National Lumber Manufacturers Association. Well illustrated, it covers the ground promised in the title and then tops it off with a glossary of lumbermen's terms and a bibliography. For more information write to the Association at 1319—18th St. N.W., Washington D.C.

A List of Research Publications is the 1957 listing of occupational and guidance materials that are available from Research Publishing Company, P.O. Box 245, Boston, Massachusetts. Included in the lists are booklets giving vocational information that is pertinent to industrial education. The catalog is available by writing to the publisher mentioned above.

Vision and Vocational Training is a reprint of an article which appeared in SCHOOL SHOP dealing with the urgent need for programs of eye protection in the nation's vocational school shops. The author is James E. O'Neil, the society's director of industrial services. Single copies are free. For bulk orders there is a five-cents per-copy charge. Write to the National Society for the Prevention of Blindness, 1790 Broadway, New York 19, N.Y.

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Safety . . . . . *from page 8*

of existing and potential hazards must be known. This is possible only through regular and complete inspections of the shop facilities. Administrators should see that such inspections are carried out and that a written report is made to them.

The *National Standard School Shop Safety Inspection Check List* can be utilized to aid in the inspection. This check list was prepared by the joint safety committee of the American Vocational Association and the National Safety Council. Copies of the check list can be obtained from the National Safety Council, School and College Division, 425 N. Michigan Ave., Chicago 11, Illinois.

The will to work safely develops from an understanding of what accidents are; how costly they can be to an individual, his family, and his industry; and how they can be prevented. If such an understanding and attitude can be developed in an industrial-education program, this will be of as much value as the vocational skills that are learned.

An accident is "any unintentional and unexpected interruption to established routine." In terms of this definition, there may be no injury present, but an accident can still have occurred. An important objective in safety education is to help students learn that an accident can result in severe financial loss even though no personal injury may occur.

Accidents are valuable only as they teach us how to avoid similar accidents. It is important that "no-injury" accidents be treated exactly as though an injury had occurred, since this offers an opportunity to correct unsafe conditions or unsafe practices before an injury does occur.

The safety coordinator should see that proper safety instruction is offered in every industrial-education class. Separate classes are sometimes provided for the training of industrial-safety personnel. In a school environment, proper safety instruction should be a part of the day-by-day teaching, although some instructors may wish to include distinct teaching-learning units in which safety objectives are primary. An important starting point is to make certain that each instructor is aware of the need for proper safety instruction and that he proposes actively to do something about it in his daily teaching.

One of the surest ways to establish an effective safety program in the school shop is to select instructors who practice safety in their everyday actions.

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Safety training should start the first day the student enters the shop and continue as long as he is there. Each student should have an opportunity to serve as safety engineer, on a safety committee, or an inspection committee. This is one means of helping each learner to develop a "safety awareness" which should lead to the development of individual safety habits.

The school-shop safety-instruction program serves a dual purpose. It must produce safe workers not only for the immediate school-shop situation but also for the industrial and home counterparts later on.

One of the outstanding weaknesses of present school-shop safety programs is failure to keep adequate records of accidents. This is one area in which a safety coordinator can take immediate steps toward improvement. Each school system should have an accident report form on which the teacher can record each accident as it occurs.

An adequate report indicates the circumstances leading up to the direct causes of the accident and the nature and amount of attention the injury received. Several researches on school-shop safety have noted the lack of uniformity in the report forms used by schools, thus making it difficult to assemble data that can be useful for instructional purposes. The report should be made out by the student and reviewed by the class, making both student and teacher responsible.

The National Safety Council provides, without charge, a sufficient number of original report forms and summary sheets to cover all anticipated accident reports for the first year such records are kept. It is recommended that individual schools avail themselves of this service, both as a means of gathering accurate data concerning accidents in the school and to aid in the process of obtaining nation-wide information that can be extremely useful for comparative purposes.

Accident reports should be compiled and analyzed at least twice each year. The summarized information can be very useful for instruction purposes; in fact, the students may take an active part in summarizing, analyzing, and coming to conclusions about the accidents that have occurred.

A composite shop-accident report for the entire school system may be made annually. This report can be compiled from individual shop-accident reports and can be valuable in determining the shops where improvement is most needed. ★

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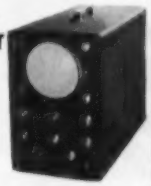

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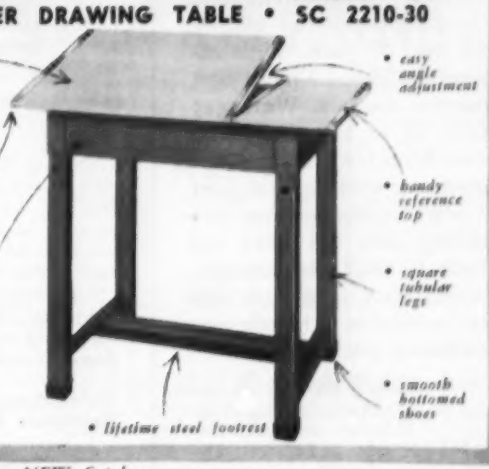
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news from Industry

(Circle the numbers on the card in this issue to secure the items listed.)

Rubber Duct Eliminates Tripping over Wires

CMG Industries announces its new Electriduct which is a noiseless rubber duct designed to eliminate serious accidents resulting from tripping over electrical wiring in the school shop.

Stumble-proof, unobstructive, and able to take the weight of heavy equipment moved over it, the company adds, electriduct comes in two forms: a complete extension cord; and separate ducts, outlets, and fittings to cover cables, wires, small hosing, and tubing.

For additional information write to CMG Industries, 615 S. Second St., Laramie, Wyo., mentioning SCHOOL SHOP; or *circle no. D-1 on the business-reply card.*

Sturtevant Adds Multirange, Multipurpose Torque Wrench

The P. A. Sturtevant Company announces the addition of a conventional, light-weight, small-size, and low-capacity torque wrench, and a series of adapters that enable increasing the range of the conventional torque wrench as high as 900-foot pounds.

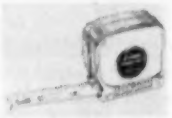
For additional information write to the P. A. Sturtevant Co., Addison, Ill., mentioning SCHOOL SHOP; or *circle no. D-2 on the business-reply card.*

Yates-American Opens Southern Branch

A branch to serve its southern customers has been opened by Yates-American Machine Co., at 532 Plaster Ave., N.E., Atlanta, Ga., the firm has announced. This means that the company has consolidated its High Point, N.C., and Memphis, Tenn., operations for the benefit of those living in south-central and southeastern United States.

King-Size Power Tape Stands Upright

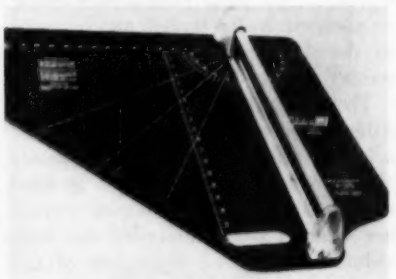
A new king-size power tape, with a ¾"-wide blade that stands upright to make difficult measuring easier and which includes a controlled-speed blade return, has been introduced by the Evans Rule Company.



According to the company, it takes only a slight bit of pressure on the control button to return the extended blade and the patented Evans power mechanism, made of molded nylon, assures a silent and dependable operation. The user, the firm says, can stop the blade at any point by lifting the thumb from the control button.

For additional information write to the Evans Rule Company, 410 Trumbull St., Elizabeth, N.J., mentioning SCHOOL SHOP; or *circle no. D-3 on the business-reply card.*

Safety Cutter Introduces New Instrument



The Slide-N-Cut Safety Cutter is the latest innovation of Safety Cutter Sales Co.

The company states the cutting board is based on smooth, durable Masonite Tempered Presdwood and is the only paper cutter with a built-in protractor for cutting angles.

For additional information write to the Safety Cutter Sales Co., Pier 25, The Embarcadero, San Francisco, Calif., mentioning SCHOOL SHOP; or *circle no. D-4 on the business-reply card.*

Utility Box Made of Fibreglass

A one-piece, molded fibreglass utility box has been recently announced by the Samuel Olson Manufacturing Company. The firm states that it has many uses in school shops and industrial-arts departments as a storage piece for in-work projects. Dimensions: 15⅝" x 20¾" x 5".

For additional information write to the Samuel Olson Mfg. Co., 2418 Bloomingdale Ave., Chicago, Ill., mentioning SCHOOL SHOP; *or circle no. D-5 on the business-reply card.*

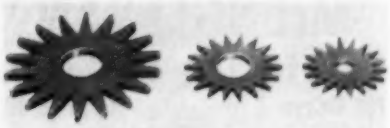
Three Cabinets and Catalog Introduced by Parent Metal

Parent Metal Products announces its new combination-base work bench; a project-storage locker; base work bench with tool cabinet; and 35-page illustrated catalog—*Blueprint for Progress*—describing its line of equipment for industrial-arts and vocational-education shops.

The work bench with tool cabinet (illustrated) is 6' long, 24" deep, and 6' 8¾" high. All doors are equipped with spring hinges and padlock attachments.

For additional information write to Parent Metal Products, 6801 State Road, Philadelphia, Pa., mentioning SCHOOL SHOP; or *circle no. D-6 on the business-reply card.*

New Industrial Cutters Provide Longer Life



Machine Products Corporation claims that its new Johnston-milled Huntington-style cutters are made to give greater wear and longer life.

The company says that these new cutters are milled, not punched, of extra high-carbon alloy steel.

They are available, the firm states, in number "0"—1¼" diameter; number 1—1½" diameter; and number 2—2⅜" diameter.

For additional information write to Machine Products Corporation, 125 Hollier St., Dayton, Ohio, mentioning SCHOOL SHOP; or *circle no. D-7 on the business-reply card.*

A "Caddy" to Carry Tools in the School Shop

Simonsen Metal Products Company announces a "tool caddy" that the firm states will bring the tools to the job instead of the job to the tools.

It is made of heavy-gage steel. Its size, the manufacturer goes on to say, is 35⅝" high x 28" wide x 18" deep, and is equipped with a one-piece deep-drawn, embossed, heavy-duty, steel work-table top.

For additional information write to the Simonsen Metal Products Company, 4444 W. Chicago Ave., Chicago 51, Ill., mentioning SCHOOL SHOP; or *circle no. D-8 on the business-reply card.*

"Spec"-Type Eyeshield Introduced by Safety Service

Style and comfort are featured in the "spec"-type eyeshield recently announced by the Safety Service Co.

The company states that the entire unit is designed to meet federal specifications for optical qualities and impact resistance.

For additional information write to the Safety Service Co., 1535 Walnut St., Kansas City, Mo., mentioning SCHOOL SHOP; or *circle no. D-9 on the business-reply card.*

Cerro Expands Alloys Distribution in Northwest

Cerro de Pasco Sales Corporation announces that its low-melting alloys marketed under the trade names "Cerrobase," "Cerrobend," "Cerro-matrix," among others, are now available in Washington, Oregon, and Idaho through a regional branch office of the Lewin-Mathes Company Division of their firm. The Lewin-Mathes office serving that area is at 1056 4th Ave. S., Seattle, Wash., and is managed by A. D. Cranmer.

New Literature:

Hallowell School Shop Furniture is a new 27-page catalog published by the Standard Pressed Steel Co. It includes the complete

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Ozalid Streamliner 400 Bulletin gives the specifications of a new low-cost volume-producing whiteprint machine. For a free copy write to the Ozalid Division of General Aniline and Film Corp., 7 Corliss Lane, Johnson City, N.Y., mentioning SCHOOL SHOP; *or circle no. D-14 on the business-reply card.*

Catalog #23 is the new 80-page, two-color catalog of Red Devil Tools showing more than 150 hand-tools and electric machines made by the firm. The catalog also includes descriptions and photos of several new tools recently added to the firm's line. The catalog is available free by writing to Red Devil Tools, Box 355, Union, N. J., mentioning SCHOOL SHOP; or *circle no. D-15 on the business-reply card.*

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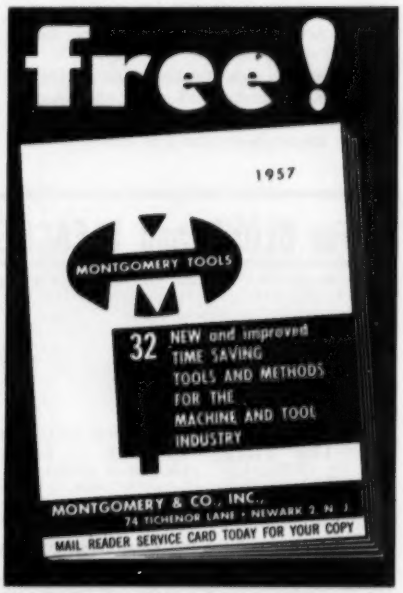
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Answers to KGD quiz on page 34:

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2. F	7. T	12. F	17. T	22. F
3. F	8. F	13. T	18. F	23. T
4. T	9. T	14. F	19. T	24. F
5. T	10. T	15. F	20. T	25. F

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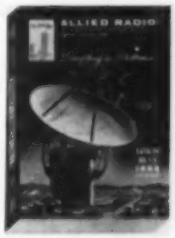
Catalog #27 is the new publication of Foster Manufacturing Company describing the firm's multipurpose storage cabinets, multipurpose gloss-top light tables, double-wall galleys, negative filing cabinets, drying racks, and other storage equipment available to art and print-shop teachers. For your free copy write to Foster Mfg. Co., 13th and Cherry Sts., Philadelphia 7, Pa., mentioning SCHOOL SHOP; or *circle no. D-18 on the business-reply card.*

Catalog #170 is the new, 1958 edition of Allied Radio's electronic catalog. It features a large selection of electronics parts and equipment for use in schools, classrooms, laboratories, and shops. It has 404 pages, 192 pages in rotogravure and 4-color covers, and lists over 27,000 items. For your free copy write to the Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., mentioning SCHOOL SHOP; or *circle no. D-19 on the business-reply card.*



Guns . . . . . *(from page 15)*

to get at the dowel-peg drawer "lock."

The cabinet door lock can be installed just above the door handle.

The drawer guides are two ¾" x 1½" pieces and six ¾" x ¾" pieces. (The four top strips can be two ¾" x 1½" pieces. The extra space on each side of the drawer can be used as a "secret" hiding place.)

Yes, my guns were framed, but they're also protected and displayed handsomely as any fine piece of equipment should be. ★

Washington . . . . . *from page 48*

shot the thing into space. We're referring, of course, to the five regional workshops conducted by the federal vocational-educational division during October and November to promote vocational-technical training. These had had their origin months before Sputnik; and, while that little sphere was turning its first 1,000,000 miles, the vocational-technical training conferences were well under way.

During each of the five sessions, held in San Francisco, Milwaukee, Memphis, Ogden, Utah, and Asbury Park, N.J., the participants held before them a sourcebook and discussion guide on vocational-technical education (not for general distribution). One page in this sourcebook raised the question which was much on the mind of Washington: "Are we losing the race to Russia?" The race referred to is the educational race and the answer suggested had overtones of the affirmative.

That being the case, many an educator borrowed the phrase of John Foster Dulles and suggested that education needs "an agonizing reappraisal." We talked to many an expert during the past several weeks and the refrain was about the same: "Science instruction needs strengthening . . ." "Math instruction needs strengthening . . ." "Guidance needs strengthening . . ."

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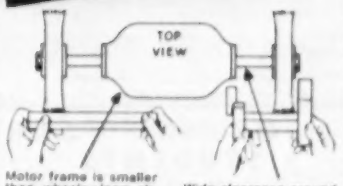

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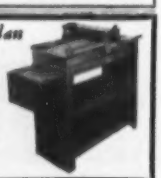

The year ended on a note of sadness for education; coupled also with a note of determination that much more needs to be done in the classrooms and shops of the public schools.

For, during 1957, more clearly than ever before, educators came to recognize public education not only as an instrument of national policy, but as a means for national survival. That recognition is one of major proportions for the year 1957.

Bulletin No. 1 on the Way.—During 1957, the U.S. Commissioner of Education, Lawrence Derthick, completed his first year in his federal post. His record includes such actions as strengthening the statistical services of the Office and continuation of the cooperative research agreements. He has shown ample evidence of his interest in vocational education—having made more than the usual number of speeches on vocational education than might be expected from a high policy-making official. He has given prompt approval to requests for new staff members to be added to the vocational-education division. He has also supported the vocational-education division's plan to use the services of consultants—an important source of expert strength for the division.

(Incidentally, the latest of these consultants is Dr. Lynn Emerson, who arrived in Washington early in October, to work on that perennial problem—curriculum materials for vocational education. Dr. Emerson is professor emeritus at Cornell University and is the author of a near-classic entitled *How to Prepare Training Manuals*. During his three-month stay in Washington, Dr. Emerson will take a new look at the products of the state curriculum laboratories to see which manuals, which workbooks, and which instructional guides are worthy for nation-wide notice. The titles of those he selects will then go into a revised version of what used to be called "List of Instructional Materials for Supplementary Training of Apprentices and On-the-Job Training.")

But to return to Commissioner Derthick—it may well be that the highlight of his year (from the vocational point of view) was the time he spent studying the revisions of Policy Bulletin No. 1. This he did in conjunction with a committee of state vocational directors and chief state school officers. And he stayed at that task no less than three and one-half days—the first time that a federal commissioner has made so

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intensive a study of an administrative instrument affecting vocational education.

Since we've mentioned Bulletin No. 1, it should be stated that the overhauling of that document also falls into our list of major educational events for 1957. Although work on changes started in 1956, and the final printing of the revised version may not take place until 1958, the long, detailed, and arduous work of improving that hoary document was concentrated during the past 12 months.

Bulletin No. 1 has an honored history, but during that history it has become a hodge-podge of law, policy, regulation, and advice. This mixture has not been helpful and has led to confusion, controversy, and a woolly approach to some phases of administrating the vocational-education acts. Now, at least we are promised a clean-cut manual in which all who run could see what is law and what is regulation—and by whose authority that regulation has been set forth.

If the new Bulletin No. 1 turns out to be all that its overhaulers plan it to be, its release will be a major event in vocational education for the year.

No Dice.—About the middle of the year, a potentially significant challenge was placed before vocational educators. The action was started by President Eisenhower's speech delivered at Williamsburg, Va. He suggested that the states take over functions which "really belonged" to the states in exchange for specified taxes now going to the U.S. Treasury. This speech was followed by the creation of a Joint-Action Committee (made up of state governors and federal officials) to pick the services for beginning this change-over. Vocational education was near the top of the list of services to be returned. And the involvement of high administration officials in this move seemed to portend that the White House was serious about this.

Ever since this challenge arose, Washington vocational educators exhibited little concern over its consequences. They held that Congress will refuse to alter its ever-popular vocational-education acts. If this conviction had some validity before Sputnik, it has gained even greater strength since. At the end of the year it became apparent that Congress would refuse to do anything that would weaken our technological resources. Thus, what might have become the biggest challenge of 1957 is fading and waning. ★

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from Washington

by Michael Paca

In Retrospect.—We look back on the educational year 1957. And in looking back we shall extricate from the maze of events a few which stand out most clearly either as challenges or achievements.

It requires no poll of experts to determine that the major educational event of 1957 centered on a high school in Little Rock. Some would hail that event because Governor Faubus (no need to identify who *he* is, a Gallup Poll discovered) sent national guardsmen to keep negroes from entering a public high school; others would hail it because President Eisenhower sent federal troops to see that the negro children had unobstructed passage in. Still others might have recognized the immensity of the event simply by the fact that education went on inside the school regardless whether armed troops outside were used to prevent or aid the entry of negro students.

The point about Little Rock, however, is that although it stirred the conscience of the world, and impelled people of responsibility everywhere to speak out, educators in Washington neither hailed, condemned, nor recognized any part of the Little Rock story. They were silent. The nation's highest official concerned with public education, Secretary Folsom, issued no statement. Neither did the U. S. Commissioner of Education. Silent, too, were the policy-making officers of the NEA, AVA, and American Council on Education. And we learn from the Council of Chief State School Officers (which has headquarters in Washington) that the Arkansas chief state school officer had also seen the wisdom of saying nothing about an historic event taking place in his own yard.

"Integration? We can't even spell the word," remarked one U.S. Office of Education official during the turbulent Little Rock days. This reflected the official policy laid down in the Office: that staff members of the federal education agency are to say nothing that would alarm or rile anyone south of the Potomac. Unofficially, it was explained that if the U.S. Office of Education were to voice its conscience in this matter "our agents would no longer be able to go into any part of the South to perform their technical duties." The National Education Association was in the unhappy position of voicing no opinion for fear of the effect that would have on its southern membership.

And so this reporter must record the fact that the major educational event of 1957 went unnoted by Washington's educational leaders.

While Sputnik Beeped.—Sputnik took to the heavens in 1957 and the long-range effect of that event on education is likely to be deep. But the immediate effect was disturbing. "We need a Sputnik-centered curriculum," said one Washington official in that gloomy moment before educators could gain perspective on the Red victory in outer space. Said another educator: "Any nation that pays its teachers an average annual salary of only $4200 cannot expect to be first in putting an earth satellite into outer space."

Executive officers of Washington organizations hastily reviewed their future convention programs to see that stronger emphasis would be placed on science and math during the proposed discussions; and educational publications were reviewed in galley proofs to make certain that articles and editorials called for more attention to technological education.

Vocational educators were a bit more composed in their reaction to Sputnik. Sputnik is a thing of science and technology. And plans of vocational educators to advance technological training had been made long before the Russians

(*Continued on page* 45)

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33	Delmar Publishers, Inc.	38
7	Delta Power Tool Div., Rockwell Mfg. Co.	19
65	DonJer Products Co.	46
73	"Dowl-It" Co.	47
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38	General Finishes Sales & Service Co.	40
57	Gilbert & Miller, Inc.	45
66	Giles & Kendall Co.	46
8	Greenlee Tool Co.	33
88	Greenlee Tool Co.	22
76	Gyro Lamp & Shade Corp.	47
4	Hallowell Div., Standard Pressed Steel Co.	4
37	Hardwood Corp. of America	40
40	Heath Co.	41
39	Holiday Inn Hotel	40
44	Holiday Inn Hotel Courts	43
77	L. H. Kassel & Co.	47
78	Kit Kraft	47
71	Lewis Machine Tool Co.	46
12	Logan Engineering Co.	26
51	Magna-Set Co.	44
49	McEnglevan Heat Treating & Mfg. Co.	44
20	McKnight & McKnight	32
23	Metal Goods Corp.	34
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68	Modern School Supplies	46
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45	Patterson Bros.	43
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85	Telephone Engineering Co.	47
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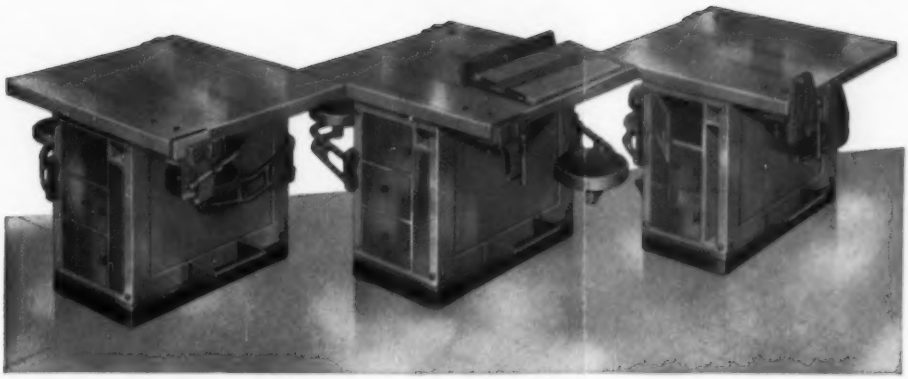
15	Tolerton Co.	29
24	Universal Scientific Co.	35
9	Wells Mfg. Corp.	23
26	Wilton Tool Mfg. Co.	35
48	X-acto, Inc.	44



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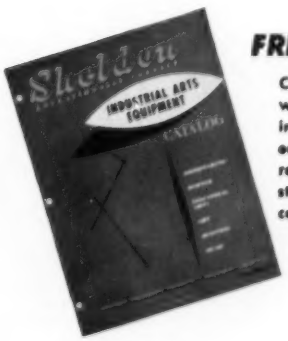

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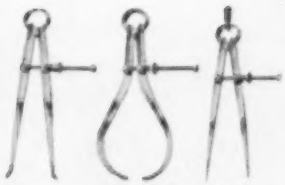

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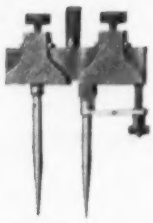

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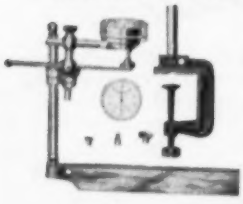

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